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An analysis of freight rates and ocean shipping of United States grain exports

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AN ANALYSIS OF FREIGHT RATES AND OCEAN SHIPPING OF UNITED STATES GRAIN EXPORTS

by

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TABLE OF CONTENTS

INTRODUCTION

The cost of shipping by ocean vessels influence the amount of heavy grain[1] exports from the United States to world markets. Rate differentials affect the competitive positions of various ports as shipping points and the inter-regional competition between and among ports. Rates also affect the competitive position of the producing areas tributary to the ports. In addition, rates associated with the transportation of heavy grain have been important factors in determining the routes over which grain was shipped. For example, the opening of the St. Lawrence Seaway greatly enhanced the competitive position of the Great Lakes region.

Ocean freight rates combined with domestic prices determine the competitive position of United States grains in the world market. Domestic prices for heavy grains have been subject to Government support programs which usually raise the price well above world market prices. To enable grain to enter the international market, the Government sometimes has paid a fee to the grain exporter about equal to the difference between the domestic market price and the international grain price.[2] The intention of the above program

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[1]Heavy grain; wheat, corn, soybeans, and grain sorghum.

[2]Furgeson, Walter. United States Department of Agriculture, Agricultural Stabilization and Conservation Service, Des Moines, Iowa. Information on export payments. Private communication. 1969.

has been to make United States grain prices competitive with other exporting countries. With competitive domestic grain prices, the country that could deliver to the buyer the cheapest, made the sale. In this particular case, the cost of ocean shipping often determined who got the sale.

The United States merchant marine has been composed of archaic, obsolete vessels of World War II vintage (13). It cannot compete with foreign-flag vessels unless subsidized because of high shipbuilding, labor, and operating costs (6). The entire United States-flag fleet has been subsidized. One portion receiving a direct subsidy, the other portion receiving an indirect subsidy in the form of an unusually high rate, per ton of commodity shipped.

PURPOSE

Ocean shipping of heavy grain is a complex and competitive industry influenced by domestic and international events, both political and economic in nature. The industry has been affected by wars, famines, droughts, economic crises, government policies, natural disasters and more.

The purpose of the present study is to serve as an introduction to this complex industry. Institutional arrangements in the ocean shipping industry have been surveyed and reported. Specifically studied were the conference system, charter parties, the world fleet, the United States fleet, factors influencing supply and demand for vessels, factors affecting the level of freight rates, and how the above factors influence the rate level associated with the transportation of heavy grain shipped via voyage chartered tramp vessels.

Data on ocean shipments of heavy grains shipped via voyage chartered tramp vessels were collected and analyzed. It was necessary to limit the scope of the study to the four major exporting ranges and their major grain exporting ports. Destinations were limited to the major importing areas receiving United States heavy grain.

Heavy grain export data from United States ports for 1958, 1966 and 1967 were used to evaluate the importance of each port region, the changes and trends that have taken

place, as well as future trends and developments.

An analysis of heavy grain freight rates was made to show the fluctuations that occur in such rates. An analysis of the relationship between the average monthly freight rates for ten years in two trade routes and a short list of world events was made to indicate the influence on freight rates by both political and economic events.

An analysis of charter options also was conducted. The results of this analysis were used as an indicator to some of the basic cost differences between different port regions and destinations.

Stated briefly, the purposes of the study was to make a comprehensive exploration of the ocean shipping industry, develop background information concerning grain shipments, analyze the factors influencing the general overall level of rates, analyze a sample of ocean shipments of heavy grains shipped via voyage chartered tramp vessels, and determine some differences in rates for different trade routes.

BACKGROUND INFORMATION

History of United States Fleet Policy

The United States Merchant Marine is heavily dependent on the present subsidy program. Subsidy for the Merchant Marine is not new; as early as 1789 the United States began a program of indirect subsidy and since that date has tried, unsuccessfully, many direct and indirect subsidy programs to promote the Merchant Marine.

Numerous reasons have been advanced as to why a nation should develop its maritime industries by means of protective policies. Three arguments seem to justify a reasonable amount of aid (21). First, national defense may be promoted by its maintenance, under national registry for use as fleet supply ships in war time and also of sufficient freighter tonnage to insure sea-borne trade against a breakdown, should a number of foreign ships be withdrawn from the United States trade. Second, sea-borne trade should be protected against interruption and unfair discrimination or competition in foreign markets as a result of the interference of foreign governments. Third, there has been a high degree of imperfect competition in sections of the shipping business, a large amount of government support, and the existence of considerable economies of scale.

Three general types of policy have been distinguished

for the protection of a maritime industry (21). First, navigation monopolies were used to eliminate some or all foreign shipping, alter trade routes, raise freight rates and promote expansion in the shipping industry. Second, subsidies may be used to expand national shipping activity on certain routes. Subsidies may be of many forms, such as mail contracts, low interest loans, sale of vessels at low prices, government contracts, operation cost reduction and construction cost reduction, to mention a few of the more popular. Third, registry policies control the supply of vessels to national owners by determining what ships shall be eligible for registry or subsidy. To date, most policies have been opportunistic and highly unstable, and have had little balance between aims and costs (21).

The United States has tried many types of policies, yet none have been completely successful. In 1789, Congress passed a bill that granted a 10 percent discount of customs duties on all imports brought into American ports by American ships. By 1794, U.S. vessels carried 91 percent of the imports and 96.5 percent of the exports whereas they carried only 17 percent of the imports and 30.5 percent of the exports in 1789 (22). The 10 percent discount of customs duties was discontinued after the War of 1812.

In 1945, Congress passed its first ship subsidy bill, with the subsidy being a mail subsidy. In 1847, Congress

provided that all ship's benefiting by the mail subsidy should be subject to the purchase and control of the Government whenever necessity required. From 1845 until 1936, mail subsidy was the dominant form of subsidy, although it varied in magnitude from time to time.

In 1916, Congress passed the Merchant Marine Act of 1916 (26) which created a Shipping Board composed of five members with the authority to organize corporations for the construction, purchase, charter and operation of ships, and with capital stock not to exceed $50,000,000 (22). Three thousand (22) ships were built in all, mainly during the war and since they were built for speed of construction, they were not of the most modern design.

The Act (26) also prohibited rebates on freight rates, use of fighting ships for the purpose of reducing competition, retaliation against a shipper by refusing space or other discrimination, and discriminatory contracts with any shipper based on the volume of freight offered (26, Sec. 14).

At the close of World War I, the United States had acquired an over-supply of ships, mostly Government owned. As a solution to the over-supply problem, Congress passed the Merchant Marine Act of 1920 (27). The purpose of the Act of 1920 (27) was to enable the Shipping Board to operate the ships until such time as they could be sold.

The Board was also authorized to determine what steam-

ship lines should be established and put in operation from ports in the United States (27, Sec. 7). If service was determined to be necessary, the Board had the power to charter vessels to any United States Citizen that could qualify.

A construction loan fund was also to be set up out of the revenue from sales and operations, the sum not to exceed $25,000,000. The fund was to be used in aid of the construction of vessels of the best and most efficient type. Aid was limited to two-thirds the cost of the construction of the vessel (27, Sec. 11).

On May 22, 1928, Congress amended the Merchant Marine Act of 1920 (27) by increasing the construction loan fund to $125,000,000 (28, Sec. 301(a)) and increasing the amount that the Government might lend from two-thirds of the cost of the ship, as provided in the Act of 1920 (27), to 75 percent (28, Sec. 302(e)). It also provided for a definite scale of ocean mail subsidies with rates varying according to the size and speed of the vessel (28, Sec. 409(a)).

In essence, the Act (28) was an attempt to subsidize the shipping industry through the use of mail contracts. The Postmaster General was to certify to the Shipping Board what ocean mail routes should be established for the carrying of mails. It was then the Shipping Board's responsibility to determine the type, size, speed, and other characteristics of the vessel which should be employed on each route,

the frequency and regularity of their sailings (28, Sec. 403). The vessels employed on these routes must be American-built and registered under the laws of the United States (28, Sec. 405).

The Act (28) also carried defense provisions. Any vessel could be taken and purchased or used by the United States if the vessel was under contract from the construction loan fund or if it was under ocean mail contract (28, Sec. 702(a)).

In 1933, President Roosevelt transferred all functions of the Shipping Board to the Department of Commerce.

The Act of 1928 (28) failed to provide for an adequate merchant marine. Despite the expenditure of considerable sums, there was a decline in the position of American shipping in foreign trade. In terms of cargo tons of exports and imports, American ships carried in the trans-Atlantic trades, 22 percent in 1928 and 23 percent in 1935, but in the trans-Pacific trades, 29 and 20 percent in the same years respectively. Between 1928 and 1935 there had been but eight cargo ships built in the United States, compared with 853 in Great Britain (21). The result was the passage by Congress of the Merchant Marine Act of 1936 (29).

The general outline of the new policy calls for differential subsidies for both shipping and ship building for vessels operating in approved trade routes. Ships built

under the Act (29) may be sold, chartered or operated. Private owners operating under subsidy are rigidly regulated concerning earnings, salaries, finances, wage rates, subsistence, and manning scales (21). The Act (29) also establishes the Maritime Commission, composed of five members appointed by the President.

The objectives of this Act can be quoted from Section 101 of the Act (29, Sec. 101).

> It is necessary for the national defence and development of its foreign and domestic commerce that the United States shall have a merchant marine (a) sufficient to carry its domestic water-borne commerce and a substantial portion of the water-borne export and import foreign commerce of the United States and to provide shipping service on all routes essential for maintaining the flow of such domestic and foreign water-borne commerce at all times, (b) capable of serving as a naval and military auxiliary in time of war or national emergency, (c) owned and operated under the United States flag by citizens of the United States in so far as may be practicable, and (d) composed of the best-equipped, safest, and most suitable types of vessels, constructed in the United States and manned with a trained and efficient citizen personnel.

The Commission was also authorized to investigate and keep records of ocean services; routes; the number of sailings; type, size, speed of vessels employed; American construction costs versus foreign construction costs; American versus foreign operating expense; and amounts of aid by foreign governments to their merchant fleets.

A construction-differential subsidy is available to aid in the construction of a new vessel, if it is to be

used on a service, route, or line in the foreign commerce of the United States and has been determined to be essential (29, Sec. 501). Plans for such a vessel has to be approved by the Navy Department to judge the feasibility of adoption for defense. The construction-differential is not to exceed 50 percent (29, Sec. 502) of the construction cost of the vessel, which must be constructed in shipyards within the United States (29, Sec. 502). The ship owner is required to pay 25 percent of the construction cost in cash and the balance within 20 years at 3.5 percent interest per annum (29, Sec. 502).

Any citizen of the United States could also apply for financial aid in the operations of vessels which is to be used in an essential service in the foreign commerce of the United States. Aid will not be approved unless (29, Sec. 601):

1. The operation of the vessel in service, route, or line is required to meet foreign-flag competition and to promote the foreign commerce of the United States and the vessel must be built in the U.S.
2. The aid applied for must be necessary to place the proposed operations of the vessel on a parity with those of foreign competitors.

A contractor under operating-differential subsidy is also limited on his profits. At the end of any 5-year period

during which an operating-differential subsidy is paid, if his net profit on his subsidized vessel exceeds 10 percent per annum on his capital investment, the contractor must pay to the United States an amount equal to one-half of his profits in excess of 10 percent per annum (29, Sec. 606).

The contractor must also create out of gross earnings a Capital Reserve Fund. The contractor must deposit an amount equal to the annual depreciation charges on the contractor's vessel on which the operating differential was being paid. He must also put in a specified amount of earnings which exceed 10 percent profit; the amount is set by the Commission (29, Sec. 607).

The contractor must also create a special reserve fund in which he must deposit annually the profits earned by the business in excess of 10 percent per annum and in excess of the amount deposited in the Capital Reserve Fund. The only disbursements allowed from this fund is to reimburse the contractor's general funds for current operating losses (29, Sec. 607(c)). All earnings deposited in the contractor's reserve fund are exempt from all Federal Taxes except earnings withdrawn and paid into the contractor's general funds or distributed as dividends or bonuses (29, Sec. 607(f)).

If the private sector fails to offer a service that the Commission deems necessary, the Commission may have vessels constructed to carry out the objectives of the Act (29, Sec.

702). It may then charter or offer for sale these vessels acquired by the Commission. A charterer of such a vessel must pay back one-half of the profits over 10 percent net profit (29, Sec. 709(a)). The charter is a bareboat charter[1] and the charterer is required to use United States officers and employees.

For defense, in time of national emergency, the Commission has the power to requisition any vessel documented under the laws of the United States (29, Sec. 901).

The purpose of the Act (29) was to provide for a merchant marine sufficient to carry its domestic water-borne commerce and a substantial portion of the water-borne exports and import trade. Before any results from the Act (29) could be distinguished, war disrupted the maritime industry. A massive ship-building program was followed during the course of the war with the end results that a large number of ships were in Government ownership at the conclusion of the war. As a result, the Merchant Ship Sales Act of 1946 (30) was passed to transfer Government owned vessels into private ownership to form a merchant marine adequate to meet the needs of American commerce and defense. A price formula was adopted, consisting of 50 percent of the prewar domestic

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[1]Bareboat charter: the owner completely relinquishes control of the vessel to the charterer, who bears the expense of operation during the period of the charter.

cost for each class of vessel, adjusted for (30, Sec. 3):

1. Normal annual depreciation at 5 percent plus war service depreciation at 3 percent.
2. Allowances to bring ships up to standard conditions.
3. Adjustments for special features.

The Act (30) also provided for sale of vessels to non-citizens, with preference to United States citizens (30, Sec. 7).

The direct results of this Act (30) were:

1. The fleets of the liner companies in the United States foreign trade were filled with a large number of the best cargo ships.
2. Tramp ship operators were reluctant to buy, but those that did, bought the slower, cheaper vessels
3. It provided the opportunity for many foreign countries to enlarge their war depleted merchant marine.

Following the conclusion of the Korean War, a major piece of legislation was passed in an attempt to help the again, oversupplied maritime industry. The Cargo Preference Act of 1954 (25) stated that 50 percent of Government-sponsored shipments must be carried in the United States bottoms if available at a fair and reasonable rate. This was the only major legislation passed that was applicable to tramp vessels as well as liners.

The results of legislation to provide the United States with a modern efficient fleet have been unsuccessful. In 1965, only 9 percent of this country's foreign trade traveled under its own flag, compared with 50 percent as recently as 1950. Operating subsidies have more than quadrupled to over $200 million annually (5).

The construction-differential subsidy may also be termed a failure. In 1965, a scant 7 percent of the volume of commercial shipyards were merchant vessels. The subsidy dollar buys so little tonnage that over 90 ships of the subsidized lines are over-due for replacement (5).

The maritime program still is controlled by the Merchant Marine Act of 1936 (29). At that time, bulk carriage in United States foreign trade was practically non-existent and the Act (29) was intended to subsidize the construction and operation of liners. Chiefly, because of the Cargo Preference Act of 1954 (25) and the agriculture disposal program, we have a tramp fleet today. Eighty-five percent of foreign trade tonnage in 1965 took the form of such dry bulk carriage as wheat. As a result, the 1936 Act (29), now covers ships which handle less than 5 percent of the total (5).

At present, $100 million per year is spent on cargo preference freight-rate differentials. Preference cargo accounted for 61 percent of the total tonnage carried by the United States Merchant Marine in 1963. In bulk carriers, it

accounted for 87 percent. Seventy-two percent of the total export cargo by United States tramps and tankers in 1963 was preference cargo moving under P. L. 480 (19).

Nicholas Johnson, head of the Federal Maritime Commission sums up the success of the Cargo Preference Act of 1954 (25, 19): "as a subsidy, direct or indirect, cargo preference has been a miserable failure: not a single new tramp ship has been built since 1956, and the cost of keeping the old ones in existence climbs higher and higher....The tramp fleet is composed of about 130 vessels. Only seven of these ships were built since World War II."

Shipping Conferences

Liners accounted for 22.1 percent of the United States heavy grain exports in 1958 but only five percent of the heavy grain exports in 1966 (4). Shipments of heavy grain via liner have not been of any great significance in recent years due to the competitive advantage that other types of carriers possess in freight rates.

Cargo liners publish rates for manufactured goods and for small quantities of bulk commodities. The rates for large quantities of bulk commodities are determined by negotiation. These carriers offer a regular service for a predetermined trade route.

Most liners are members of conferences which were

legalized by the Shipping Act of 1916 (26) under the condition that they file their articles of agreement with the, now, Federal Maritime Board (12).

A shipping conference is an unincorporated association of mutually competitive liner operators, maintained for the purposes of (7):

1. controlling competition among its members and
2. strengthening the members, through cooperative action, in their competitive fight against nonmember carriers.

Membership is voluntary and one may withdraw from membership upon giving notice of withdrawal after a specified waiting period.[1]

Conference members perform the major portion of berth or liner service in world trade. In many trades there are no independent (i.e. nonmember) liner operators (7). At the present time there are approximately 110 conferences in the ocean trade of the United States (2). Any liner operator may belong to more than one conference, with one being a member of 21 conferences (7).

The two main advantages provided by conferences are that they provide rate stability and regularity of sailings. The rate stability eliminates the unpredictability that is

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[1]The Shipping Act of 1916 (26) specifies from 30 to 90 days.

associated with unregulated rates. Stable rates are an essential part of the process of pricing a commodity in the export markets. The regularity of sailings provides the opportunity for an exporter to plan his shipments for the future.

Two disadvantages can be associated with the conference system. One is the elimination of competition and the second one is the exclusive patronage arrangement.[1] Critics of the system feel that the level of ocean freight rates is probably higher than it would be if the forces of competition were freely at play (2). The exclusive patronage arrangement is presently in the form of dual rates in the United States and deferred rebating[2] in foreign countries. Many critics of the system feel this is a discrimatory act and is therefore unlawful (7).

The dual rate which is present in the United States trade is a contractual arrangement whereby an exporter, in exchange for committing 100 percent (11) of his shipments to the vessels of a given conference, is granted a rate that may

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[1]Exclusive patronage: the shipper signs an agreement where he promises to patronize conference members and not patronize nonmembers, that is for the trade covered by the conference and in return the shipper gets a lower rate.

[2]Deferred rebates: a return of any portion of the freight money for exclusive patronage.

be as much as 15 percent below the published tariff rate that applies to exporters who do not sign exclusive patronage contracts (2).

The main provisions of the dual rate contract are that the shipper will offer to the steamship lines composing the conference, 100 percent of the cargo that he has for shipment in the trade covered and if the shipper deliberately breaks the contract by shipping cargo on a steamship line that is not a member of the conference, he loses his standing as a contractor.

The controversy over the dual rate contract lies not with the shippers who sign the contract (who have the choice of signing or not signing) but in the effects these contracts have on the independent lines. Isbrandtsen, an American flag shipping company that, until recently, had not been associated with any conference, claimed that the dual rate system damages the competitive position of the independent in trades where it exists (7). In a 1958 ruling on a suit brought against the conferences by Isbrandtsen Lines, the Supreme Court decided that the dual rate system was integral to current conferences operations. As such it should be immune from United States antitrust laws (15).

Acting on this decision, Congress passed the Bonner Act of 1961 amending the 1916 Shipping Act (26). The Bonner Act legalized the dual rate system, it included a series of

stipulations that contracts had to meet. The Federal Maritime Commission was given the task of policing the rules (15).

Regulatory Agencies

The Shipping Act of 1916 (26) established the United States Shipping Board, a Federal agency whose powers included the regulatory functions set forth in the Act. In 1933, the Shipping Board was abolished and its powers transferred to the Secretary of Commerce, and a subdivision, called the United States Shipping Board Bureau, was established within the Department of Commerce. In 1936, a new agency, the United States Maritime Commission, inherited those powers. In 1950, the Maritime Commission was dissolved and its functions were transferred to two new agencies; the Federal Maritime Board and the Maritime Administration.

The two new bodies, although technically distinct, maintained joint operation of officers and employees as a single body of personnel, and the chairman of the Federal Maritime Board also served as head of the Maritime Administration. The Board determined and awarded subsidies and exercised the regulatory powers over carriers in foreign commerce. The Maritime Administration performed the functions previously vested in the Maritime Commission, such as specification of essential trade routes, supervision of ship

construction, and maintenance of the reserve fleet (13).

In 1961, the Federal Maritime Board was abolished and its functions were transferred to the Secretary of Commerce. The Secretary of Commerce in turn delegated these tasks to a Maritime Administrator and to a newly created Maritime Subsidy Board, which is subject to review by the Secretary of Commerce. The regulatory functions were given to the Federal Maritime Commission.

The duties of the Commission are mainly concerned with firms who are members of conferences and engaged in foreign trade on essential trade routes. The Commission has the authority to disapprove any rate which it finds to be so high or low that it is detrimental to the commerce of the United States. It is also required to maintain a record of all tariffs in which it is involved. All dual rate contracts must be approved by it and available to all shippers. Also, all anti-competitive agreements must be filed and approved by the Commission. It is also authorized to investigate any discriminatory practices.

As one can readily see, maritime regulatory agencies have been subject to many changes within the last fifty years. It appears that the cause of the changes was the dissatisfaction associated with the relative position of the United States fleet and it is an attempt by the Government to rectify the problem through changes at the administra-

tive level.

Charter Parties and General Charter Provisions

Ocean carriers offering irregular service with no fixed ports-of-call are known as tramps or tramp steamers. Grain, coal, and other bulk commodities are their chief cargoes. Their rates are determined by negotiation between the shipper and the carrier, with a ship broker serving as the go-between. The agreement that results from these negotiations is called a charter party. Charter parties are documents which form the contracts between the ships owners, or his agent, and the charterer, the man who leases the ship.

There are three basic charter parties (8); the bareboat, time, and voyage charters. Bareboat charters are the least used type of charter. Many experts class this charter as "Government type charter" because its use is usually associated with Government charters. The charterer functions as the ship owner and must man and provision the ship and perform the other related functions of a ship owner. The length of time associated with such a charter party depends on the individual charter party but usually is for at least one year.

Voyage charters are made for a certain voyage or series of voyages. In such a charter, the owner usually bears all the expenses of the voyage--or the charterer may be required

by the agreement to pay certain of the expenses relating to port or terminal activities.

Under time charters the vessel under contract becomes the possession of the charterer for a stipulated period of time, with the usual arrangement being that the owner of the ship supplies the crew, their food and maintenance, and keeps the ship in repair, while the charterer furnishes the fuel and pays the port and terminal charges.

The following discussion will omit bareboat charters and cover time and voyage charters exclusively. At the present time bareboat charters are seldom used.

There are two main sources of charters; the Chamber of Shipping of the United Kingdom and the New York Produce Exchange. The provisions of the Chamber of Shipping of the United Kingdom and the New York Produce Exchange are almost identical with respect to the division of the expense burden between owner and charterer. The Chamber of Shipping's Baltime form, used much abroad, tends to be more favorable to the owner and less favorable to the charterer than the Produce Exchange's. Most United States charterers use the New York Produce Exchange's. The following discussion will be limited to it.

The provisions of time and voyage charters both state the vessels net tonnage. The time charter goes into greater detail: it states deadweight tonnage, horse power, speed, and rate of fuel consumption. Both charters have provisions

as to the sea worthiness of the vessel.

Voyage charters also indicate the ports from and to which they apply. A time charter generally contains much broader provisions as to ports to be served than does a voyage charter; it ordinarily indicates only a few areas not to be served such as a war zone for which the crews may demand bonuses.

Earliest date and latest date by which the vessel is to be ready for loading are usually set. Also usually given are the lay days.[1] Under either type of charter, the charterer is generally given the option to cancel if the owner fails to furnish the vessel on time.

Liens are also established by charter provisions. The charterer is given a lien against the ship for payments made by the charterer that are in excess of what the owner has earned under provisions of the Produce Exchange form. A lien is also established for the owner on cargoes for an amount equal to the value of the charter party. In the case of voyage charters, this lien is important to the owner because of the cesser clause, which states that the charterer's liability shall cease upon shipment or completion of loading of the cargo (7).

In a time charter, the freight rate is usually stated as so much

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[1]Lay days: time allowed for loading or unloading.

per dead-weight ton per month. The vessels capacity is not merely the cargo-carrying capacity but the total, including the capacity used for fuel and stores.

In most voyage charters, the rate is stated as so much per cargo unit. The quantity of cargo to be shipped is generally stipulated in the charter. The usual practice with respect to various commodities is to state in the charter a range of weights, within which the owner may select the weight of the cargo to be carried. If he ships less, he must pay the rate for the lowest weight in the range.

Occasionally, a lump sum is agreed upon as the freight charge. Stipulation of a lump sum may reflect efforts on the part of the charterer or the owner or a broker for one of them, to outwit the other party.

For voyage charters, the port of loading and unloading may be quoted for a range which may include numerous ports. Exporters will try to obtain the broadest possible range of options regarding ports of loading and unloading within a coastal zone. The relative bargaining power of the parties at any particular moment determines how much flexibility will be conceded to the operators, although normal usage sets some limits on the range within which this bargaining operates (14). A big shipper may also try to reserve himself the right to declare the port of unloading only after a more or less lengthy time during which he may await market

developments after the merchandise has already been loaded.

Voyage charters also state the lay days or time allowed to the charterer for either loading or unloading. A subtle form of discount may be provided in connection with lay days. The number of days allowed for loading and unloading is usually quoted. If the charterer fails to complete either within the lay days, he pays an additional fee called a demurrage. But if the vessel is loaded or unloaded in a shorter time than specified, the charterer usually receives what is called dispatch money. By agreeing on an unusually high number of lay days, the parties can virtually eliminate the possibility of demurrage and can make the payment of dispatch money almost inevitable (7).

Customary procedure in chartering of an ocean vessel for one voyage is to state who must pay for the loading and unloading of the vessel. This is especially true in the grain trade. "Gross terms" specifies that the ship operator must pay for both the loading and unloading of the vessel. The expression "free discharge" means that the cargo will be unloaded at destination free of expense to shipowners. The expression, "free in and out" means that the shipowner is not responsible for the expense of loading or unloading.

Description of the World Fleet

World fleet developments since World War II can be classified into three general areas (13). First, there has been a trend towards increased government involvement. This involvement may be in the form of ownership of vessels and/or special privileges and discriminatory practices for the national flag fleet. Second, the number of nations that have national flag fleets have increased. The third area was the emergence of flags of convenience.

In 1949, 46 nations had a national fleet, in 1963 the number of nations with national flag fleets had increased to 66 countries.[1] Of the 20 new national flag fleets organized, at least half were initially financed and continued to be largely controlled by government. The relative concentration has also changed. In 1949, eighty-five percent of the world's tonnage was concentrated under a dozen flags, whereas in 1963 the same nations controlled 70 percent. The size of the world's fleet has doubled in terms of tonnage since its peak prewar year which was 1929 (13).

Government subsidy is not an uncommon phenomena with respect to the world fleet. The United States, France, and Italy provide direct subsidy payments to their national

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[1]National flag fleet: any nation with five or more ocean-going vessels, 1000 gross tons or over (13).

fleet. Other countries such as Australia, Canada, India, Japan, Spain and Yugoslavia provide indirect subsidies of various types. The subsidy may be in the form of a special tax program, loans at low interest rates, depreciation of 140 percent of the purchase cost as used in Great Britain, or a subsidy to the scrap market to encourage the scrapping of obsolete vessels as used in West Germany. The world merchant marine is not a truly competitive industry (13).

Discrimination towards one's own flag is also a common phenomena. The principle form of preference is to permit shipment of certain cargoes on national flag vessels only. The extent of government discriminatory activities is hard to determine. It has been estimated that less than 5 percent[1] of the world's ocean commerce is shipped under discriminatory practices (13).

The United States-flag fleet must compete with foreign-flag vessels for most cargoes. The foreign-flag fleet may be divided into two distinct flags; the national flag vessels and the flags of convenience vessels. The latter will be discussed in detail later.

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[1]Based on 1957 data (13).

Description of the United States Fleet

The United States-flag fleet size has been influenced in the past half century principally by the massive shipbuilding programs associated with World Wars I and II. As a result, the fleet's tonnage has fluctuated greatly in the last fifty or so years. World War I left the United States with a fleet five times larger than the prewar fleet and more than half of this was owned by the Government. This fleet accounted for 22 percent of the world fleet (13).

Approximately twenty-five years later the United States faced the same problem, this time a result of the shipbuilding programs of the Second World War. At the close of the war the United States owned 60 percent of the world's tonnage as compared to 14 percent in 1940. With the passage of the Merchant Ship Sales Act of 1946 (30), the United States fleet was reduced to 36.4 percent of the world's fleet in 1948. As of 1962, United States fleet tonnage had dwindled to 8.7 percent of the active world fleet (13).

The United States Merchant Marine carried only 8 percent of United States imports and exports in 1966 (23). Throughout the past fifty years, the percentage of United States cargo carried on United States-flag vessels has varied closely with the size of our fleet. From 1904 to 1914, an average of 10 percent of America's foreign commerce were carried on its own flag vessels (36). Around 1930, one-third

(36) was carried and five years later it had climbed to 35 percent (35).

The United States fleet is composed of two separate competitive fleets; the subsidized fleet and non-subsidized fleet.[1] The subsidized fleet is in the more favorable position due to its favorable tax position and capital structure. They were able to multiply their net worth by five between 1937 and 1946; the non-subsidized only doubled their equity (13).

Since 1948 the margin between the "haves" and "have-nots" of the industry has widened. The net worth of the subsidized companies has again more than doubled. The assets of the remainder of the dry cargo sector of the industry in contrast have probably declined. The number of freighters enrolled in the subsidy program, however, has increased only slightly, from 250 in 1948 to 287 in 1963. During the same period, non-subsidized companies have suffered a net loss of roughly 250 ships through transfers, scrappings, and losses at sea (13).

From 1946 through the mid-point of the Korean War (1952), subsidized operators earned (after recapture and taxes) an average of 12.6 percent of their net worth; non-

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[1]Non-subsidized refers to no direct subsidy. The non-subsidized fleet may receive indirect subsidy such as an unusually high freight rate.

subsidized lines reporting to the Maritime Administration earned 6 percent (13).

During the next five years, earnings for both groups were lower but still reasonably adequate. However, because of the 1958 break in the shipping market, lack of earnings plunged most non-subsidized lines into a loss position, while the subsidized group, although also seriously affected, continued to show some return on net worth, averaging 4.6 percent from 1958 through 1962 inclusive (13).

The current financial position of the United States-flag vessels operating outside the direct subsidy program cannot be assessed with any degree of confidence. Public reports are filed only by carriers holding Government-financed ship mortgages or operating in a regulated domestic trade. On the highly volatile and speculative tramp industry, there is no reliable or comprehensive information available. Although the tramp group claims heavy losses on current income and expense losses, the frequent transfers in corporate ownership of their ships suggests that the business has been geared to maximizing tax-free cash flow from depreciation and to taking capital gains on ship sales. In order to limit liability, independent shipowners have often organized separate corporations for each ship.

New equity capital for subsidized companies from 1936 through 1962 totaled only $16 million, excluding $12 million

of stocks issued in exchange for vessels. All but $4 million of the cash subscription occurred prior to World War II (13). In contrast to the subsidized companies, non-subsidized shipping has attracted a significant amount of risk capital, much of it frankly speculative. Nonetheless, it is ironic that this sector of the industry should have attracted more investor attention than the companies participating in a program intended to enhance their investment status.

A strong financial position coupled with construction subsidies and mortgages guarantees has permitted the subsidized companies to acquire some of the world's finest dry cargo liners and to undertake a systematic program for replacement of their fleets. In contrast, there is no program at all for replacement of the war-built freighters operated outside the subsidy program and no likelihood within the framework of the present subsidy program that one can be arranged. Since World War II only five new dry cargo vessels have been built for non-subsidized service. Whereas, 43 percent of the ships operated by subsidized companies as of December 31, 1964, had been constructed since World War II (13).

Maritime labor unions have had a great influence on the United States-flag fleet. According to one author (13), these unions have alienated customers, pushed up costs,

retarded introduction of new technology, undermined public confidence, discouraged investment, and contributed to the contraction of the United States-flag fleet.

Abetted by the stimulus of subsidies, shipboard wages have risen to a level well above the wages for jobs otherwise available to seamen. Job rationing has been practiced by certain maritime unions for many years. Seventy-two percent of a seaman's wage was paid out of tax dollars. With maritime wages always increasing, the wage subsidies have increased from $40 million in 1950 to $177 million in 1964. Productivity has increased only slightly (20).

Crew size for newly automated freighters has been reduced from 50 to 35, but many experts feel that these vessels could be automated to the point where a crew of only 12 would be required. The struggle for more automation will not be easy. The Maritime Commission will have to fight the shipbuilders and the shipping companies plus the longshoremen's unions and the seamen's unions. These unions possess the power to tie-up the nation's foreign trade (20).

Furthermore, unions have not readily accepted new cargo handling techniques or new innovations as readily as they could. Nearly 60 percent of our freight bill when shipping abroad is incurred within a few miles of the port area. One method of reducing our freight bill then is to reduce these costs by improved cargo handling methods and modernizing our

ports (20).

One of the main goals of the Merchant Marine Act of 1936 (29) was the maintenance of a United States-flag fleet to serve as a military auxiliary in time of national emergency. Since the act was only applicable to vessels engaged in foreign trade on essential trade routes, the liner should be the vessel that fulfills this role as a military auxiliary. It now appears that the non-subsidized vessel is the one who must adjust to the needs of the military.

Today's vessels are becoming more and more specialized and there is a general feeling that they are not applicable to military operations. Many of today's fleet, because of their size cannot enter a number of the world's ports. Also, many of the vessels that have been built in the last ten years have been built without military features as required under the Act of 1936 (29).

The time involved in getting the United States-flag fleet home is also another factor to consider. Three months must be allotted for this purpose. It therefore appears that the military must rely on the obsolete reserve fleet and the flexibility of the tramp fleet for fulfillment of emergency needs.

There are many disappointing aspects of the United States fleet. There has been a persistent decline from their wartime peaks in the number of United States registered ships.

One major disappointment is the apparent disorganization of our tramp fleet which handles much of our bulk cargoes and for which the military must rely on as an auxiliary fleet. The reserve fleet also is in a state of slow physical deterioration.

The subsidized sector of the fleet operates the best ships, enjoy the best earnings and reserve funds and are protected from competition through membership in conferences and through the Maritime Administrations surveillance of essential trade routes.

The non-subsidized sector is operating war-built equipment on a narrow margin of profits. Its future is tied very closely to the unpredictable shipping requirements of the Government's foreign aid agencies. The sector of the fleet which carries the main portion of the United States commerce shipped on United States vessels and is our military's auxiliary fleet has no assistance in replacing the obsolete equipment or operating subsidy to help overcome the high cost of operations and high wage rates.

A comparison of the United States-flag vessels with a foreign nation's is rather difficult because of differing accounting procedures. The two best indicators not appreciably affected by differing accounting methods and capital structures are cash flow and dividend distribution achieved per ship (13).

For the period 1958-61 inclusive, the fifteen United States subsidized lines[1] reported an average net cash flow of $79.6 million annually or $230,000 per ship per year. After tax earnings were $125,000 per ship, and dividends $50,000 per ship. During the same period, eight major European lines owning 780 vessels averaged a cash flow of only $127,000, earnings of $21,000 and dividends of $13,400 per ship (13).

Flags of Convenience

International competition in merchant shipping has been further complicated by the emergence of flags of convenience. Flags of convenience are registries offered by nations with few requirements for merchant shipping and who are willing to register foreign owned vessels as their own for only a minimum fee and taxes and few restrictions.

Flags of convenience emerged around 1939 when the United States was following a neutrality policy but wished to help her allies with shipments of supplies. There are three main flags of convenience (PANLIBHON); Panamanian, Liberian, and Honduran. Recently Lebanon, Morocco and Tunisia have readily accepted foreign owned vessels for registry.

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[1]Figures are not available for a comparison of our non-subsidized sector of the fleet.

With the sale of United States surplus ships, following World War II, flags of convenience registries swelled in late 1949 and early 1950. Between 1950 and 1963 the deadweight tonnage multiplied by four, growing from 5.7 to 12.8 percent of the active world fleet (13).

Flags of convenience have been most attractive to American shipowners, for whom they provide a refuge from the world's highest seafaring wages and also offer the option of shipbuilding in foreign countries which are much lower in cost than American shipyards. As of January, 1963, it was thought that 45-50 percent of the tonnage was owned by Americans (13).

Despite its distinct advantages, PANLIBHON and other flags of convenience suffer certain disadvantages. The most important is the lack of national flag patronage and preferences. As a consequence, flags of convenience have been used for services in which national flag allegiance is relatively unimportant. They also face an uncertain status in international law and lack any effective government protection, which can lead to inconvenience and embarrassment during periods of international tensions. They are bitterly opposed by international labor.

These foreign registries have created an important source of competition for United States foreign trade cargoes and for United States investment.

Summary

At no time since 1947 has the United States-flag merchant marine carried as much as 50 percent of the total dry cargo tonnage of the United States foreign trade, the implied objective of the 1936 Act (29). The Government has not even attempted to win a substantial segment of the private bulk cargo or tramp cargoes for its own flag ships, but has instead tacitly accepted use of foreign flags, including United States owned flags of convenience, to handle non-liner commercial business (13).

STRUCTURE OF MARINE FREIGHT RATES

Heavy grains are exported on three general type of vessels; liners, tankers, and tramp steamers. Liners accounted for 22.1 percent of heavy grain exports in 1958 but decreased to 5.1 percent in 1966. Tankers increased their portion of the trade from 6.3 percent in 1958 to 14.3 percent in 1966. Tramps accounted for the major share in both years and have increased their relative share, carrying 80.6 percent in 1966 and 71.6 percent in 1958 (4).

Tramp shipping of United States grain under voyage charter may be divided into two distinct markets. One composed of United States-flag vessels competing for 50 percent of the Government-sponsored grain cargoes guaranteed them by the Cargo Preference Act of 1954 (25); the other is foreign-flag vessels competing for private shipments and the remaining portion of the Government-sponsored grain cargoes. The rates charged by United States-flag vessels are so much higher than those charged by foreign-flag vessels that competition between the two is non-existent. Consequently, United States-flag vessels are found in the trades where large quantities of Government-sponsored grain move.

Anatomy of a Freight Rate

Competition, costs, and commodities go hand-in-hand in determining a grain freight rate. Although competition appears as the dominant factor, the influence of costs and commodities must not be forgotten (10).

Commodity

The nature of a commodity is one of the major factors which make up the anatomy of an ocean freight rate. The character of the cargo will influence the costs associated with its handling, stowage, and its susceptibility to damage and pilferage. The value of cargo per unit weight and the volume and availability must also be considered.

Heavy grain has a low value per unit of weight. Pilferage and damage, because of grains low unit value does not appear to be a major cost consideration. In most cases, heavy grains are shipped in shipload quantities, but the availability of such shipments varies from time to time.

Costs

Distance as a determinant of cost is not so important as might at first be supposed, because of the large proportion of terminal costs to total costs incurred by an ocean carrier. In some trades this proportion is well above 50 percent. Accordingly, total costs increase at a much

slower rate than distance; for example, an increase of 40 percent in distance may entail an increase of only 20 percent in costs (7).

Other costs which must be considered are:

1. Cost of handling; which will be directly influenced by the commodity and degree of mechanization.
2. Lighterage; incurred at ports where ships cannot tie up at piers (e.g., tankers active in the trade destined for the East Coast of India).
3. Costs of calling at several loading or unloading areas. Extra charges vary from 25¢ to 50¢ per long ton for each additional port (16, 17, 18).
4. Fixed charges, such as interest on indebtedness, rental, and other fixed charges that must be covered in the freight rate.
5. Insurance on hull, workman's compensation and other insurance.
6. Port facilities costs; berth fees.
7. Port regulations; hours of transit. If a ship arrives in a port at an hour in which facilities for piloting, towing and berthing are not available, this constitutes lost time.
8. Port charges and dues of every nature.
9. Canal tolls.
10. Port location; ports located on rivers require

extra time.

We must also recognize economies of scale that will influence the costs involved. Ocean transportation has the tendency to operate like an industry with decreasing costs. Economies in the overhead of management and administration of a shipping concern is evident. The complex nature of the maritime industry requires highly developed managerial abilities. The reason for the complexity of this activity can be found in the unstable character of ocean traffic with its exposure to constant and violent fluctuations, rapid change in prospects, and unique difficulties in correctly forecasting future developments. One must compete with firms of other nationalities which enjoy the advantage of favorable treatment and protection by their governments (14).

The possibility of operating a larger vessel can also increase economies of scale. This possibility requires not only the necessary volume of freight, but also adequate port facilities. Once these two requirements are met, there is no doubt that within certain limits the cost of transport per unit decrease as the vessel's capacity rises.[1]

The possibility of external economies must also be considered. If complementary activities are achieving a higher degree of specialization and efficiency, the efficiency of

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[1]For information concerning costs associated with shipping see Davis, LeRoy (4).

the maritime enterprise itself will also increase.

The production costs of ocean transport service are distinguished by the heavy weight of fixed costs. This fact is important in a variety of ways. Shipping concerns are notable examples of firms operating under increasing returns precisely because of the high proportion of fixed costs to total costs. Substantial economies of scale can therefore be gained as the enterprise grows in size. This, in turn, makes modestly endowed firms turn to the use of chartered vessels rather than operate their own ships.

The factors which might cause rates on one route to be higher than those on another are (7):

1. Distances - longer distances entail higher costs.
2. Volume of traffic - influence economies of scale.
3. Directional balance of traffic (i.e., more economical per unit; if approximately half of its moves in each direction).
4. Ease of access to berths.
5. The frequency and degree of port congestion.
6. The quality and cost of stevedoring.
7. The quality and cost of repairs.
8. The cost of fuel.
9. The charges imposed on ship operators by governmental agencies and by terminal owners and operators.

10. The rates and quality of transportation by rail, truck, or domestic water carrier between various ports and the ultimate origin or destination of the goods, as well as the cost and expedition of transfer at the port.
11. Quality and cost of storage at the port; the availability of forwarders.
12. The availability of free counsel on problems relating to transportation.

Competition

Changes in the demand for a product and in the supply of the product tend to effect changes in its price. A difference in its application to foreign shipping, follows from the greater sensitivity of demand and supply in that field to certain international factors related to political and military developments which are subject to extreme and sometimes sudden change. As a consequence, the market for foreign shipping is characterized by relatively sharp swings, both upward and downward.

Supply of shipping capacity

The volatility of the market in ocean transportation is a consequence not only of abrupt changes in the demand for the service but also of two characteristics in the behavior of the supply of vessel tonnage (7): 1. Abrupt

changes in supply without regard to the demand for the service. 2. Failure of the supply of vessel tonnage to adjust itself rapidly to changes in demand. This supply should not be gauged solely by the amount of world tonnage in existence, for part of the world tonnage will be unavailable at a given time in a given trade.

Failure of the supply of vessel tonnage to adjust itself or to remain adjusted to the demand for service results from a combination of factors. A vessel's usefulness is usually taken to be twenty years but in many cases it is much longer. There is also a high cost associated with the laying up of a vessel. Construction of a new vessel may require a year or two, and by the time of delivery a volatile demand may have become much more intense or may have turned sharply downward.

As a result of these factors, there sometimes are serious time lags in the adjustment of vessel supply to the demand for shipping service and sometimes changes in supply without regard to demand requirements. These lags and changes may operate in either direction, i.e., to create a shortage or an excess of tonnage.

The results of this volatility in the relation of supply to demand are a tendency towards great variation from time to time in rates changed by ocean carriers. The sharpness varies because charter rates may reflect actual and

presently anticipated changes in the volatile relation of supply to demand.

As a direct consequence of changes in the prospective earning power of a vessel, the vessel's market value will change. Earning power is virtually the sole determinant of vessel value. A new vessel cannot be obtained immediately, and, by the time the vessel owner can have one built, the demand for whose exploitation he wished to use the vessel may diminish in intensity and will certainly diminish in duration (7).

In the short-term supply schedule and intermediate supply schedule we have several factors to consider. This time period would consist of the period of time less than the time needed to build a vessel. Factors to consider are; speed of vessels, conversions,[1] tie-ups,[2] repairs and scrappings.[3]

The main purpose of slowing down a vessel would be to save on fuel, but the result is loss of capacity. It is

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[1]Conversions: refers to the entrance or exit of vessels to or from other trades, such as bulk vessels entering the oil trade or tankships entering the grain trade.

[2]Tie-up: refers to idleness for economic reasons. When a vessel is in tie-up it is under the care of only a skeleton crew that stands watch and performs minor repairs (37).

[3]Scrapping: breaking up old vessels for scrap metal.

necessary, therefore, to balance the cost of such loss of capacity against lower usage of fuel. With an increase in speed, we use more fuel and also increase capacity. The increase in cost of fuel must be offset by the increased revenue from additional returns from the increased cargo. The relative increase of speed will be limited by technical conditions of the vessel and with a higher depreciation of machinery.

Very closely correlated with the speed of the vessel is the time occupied in loading and discharging which may be decreased by careful allocation and management of ships, labor, and storage equipment, so as to eliminate all avoidable delays.

Conversions of other vessels to the grain trade is becoming more important each year. Tankers are carrying a larger percent of the grain exports each year (4). The estimate of cost of cleaning a tanker varies with the source. One source (37) states the cost as $30,000 to $35,000 for a 16,500 D.W.T.[1] vessel. The other source (1) states the cost to range from 1500 pounds ($4,200) to 5,000 pounds ($14,000).

The incidence, as well as the level of repairs is expected to vary with the level of the spot rates. During periods of low rates, repairs are extended as long as

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[1]Dead weight ton.

uncertainty prevails. Once the near-future course of rates becomes clear, vessels are taken away from extended repairs and led to tie-up. Tie-ups occur when the loss incurred by operating is greater than the cost of idleness. Very closely associated with tie-ups is the number of scrappings (37). Scrapping will seldom occur at high rate levels but is not an uncommon operation at low rate levels. Scrapping will generally occur during extended periods of low rate levels (7).

Demand for shipping capacity

The elasticity of demand for a service with respect to a specific commodity tends to vary in part with the elasticity of the demand for the commodity itself. A high ratio of freight rate to value tends to imply a high degree of elasticity in the demand for the serivce. That is, if the freight rate is approximately half of the value of the commodity, and 10 percent of the value represents profit, a 16 percent increase in the rate will reduce the profit from 10 percent to 2 percent. If the freight rate is only 5 percent of the value of the commodity, a 16 percent increase would reduce the 10 percent profit to 9.2 percent (7).

A dramatic expansion in vessel lot shipments, predominately via foreign flags, has resulted chiefly from increased movements of cheap, nonperishable, bulk goods as compared to manufactured and finished products.

The increased use of tramps and bulk carriers to carry bulk commodities also reflect changing economies of ocean transportation. Prior to World War II, intense competition for cargoes and the concentration of government aid on berth services caused about one-third of the bulk cargoes in United States foreign trade to be shipped on liners (7). Since World War II neither United States nor foreign flag liners have been compelled to consign so large a portion of their capacity to low-rated bulk goods.

Freight rates

Fluctuations of charter quotations have become more violent in the period following World War II. Two main reasons account for this (14): one, the intervention in the commodity markets by governments offering, withholding, or buying large volumes of such products has created new and practically unforeseeable oscillations in the demand for tramp shipping, and second, the growing tendency of shippers to own their own fleets or to hold substantial long-term time charters has made the market for shorter charters more supplemental and marginal and subject to great variation. Among tankers, the opposite tendency seems to be at work with the share of independent operators rising (14).

Wartime controls over ocean freight rates were discontinued early in 1946. Through 1948, charter rates on both United States and foreign tonnage stood at three to

four times their depressed prewar levels. In mid-1948 the tramp charter rates declined to about half its postwar peak. At the outbreak of the Korean War, tramp rates increased to almost triple their 1949 low, to which they returned following activation of reserve ships which operated as an important brake (13).

During periods of short supply, United States-flag tramps have been able to operate profitably at the world market rate. However, when charter rates have dropped, American operators have been unable to meet foreign competition. As a result, United States registered tramps have had to charge more than the going foreign rate. In 1963, this differential was approximately 2.2 to 1--a surcharge which only the Government has been willing to pay (13).

The most significant variable in shipping costs is the increased cost of labor associated with United States-flag vessels. Prior to World War II, United States seamen's wages were about 50 percent above those of the principal European maritime nations. Now they are three to five times greater (13).

In recent years, rates paid for shipments via United States-flag tramps have averaged more than twice those charged by foreign flags. Furthermore, United States-flag liners, both subsidized and non-subsidized have been able

to maintain their rates at approximately the level charged by United States-flag tramps. Rates for shipments via the few modern United States-flag supertankers which have participated in the business appear typically to have been 20-25 percent below the tramp rates, although this difference may be partially a result of differences in the costs of loading and discharging cargoes (13).

United States grain exports under government financed programs, including PL 480 and A.I.D. shipments amounted to 8,179,721 long tons in 1958 and 15,780,507 long tons in 1966 (4). Government financed shipments amount to a substantial number of shiploads. If the average shipment in 1966 was 20,000 tons, this would amount to approximately 890 shiploads of grain.

The Department of Agriculture requires that countries purchasing PL 480, Title I grains, repay the United States for the estimated cost of shipments set on United States-flag vessels. In 1963 the estimated expense of handling $147 million of United States-flag shipments via foreign carriers was $67.5 million--54 percent below the United States rate (13).

About $20 million of indirect subsidies is estimated to have been paid to United States-flag liner companies through rates on Government-sponsored bulk cargoes in excess of rates charged by foreign carriers for comparable

service (13).

Shipments of subsidized farm products through private channels does not fall within the scope of the cargo preference laws. However, in October 1963, President Kennedy stipulated that Government approval of wheat exports to Russia would be conditioned to their transport in available American ships, supplemented by ships of other countries as required.

Surplus grain shipment rates are negotiated, regardless of whether shipment is by tramp or liner. Although rates are negotiated, there is a potential for considerable competition among United States-flag ships for the United States share of surplus grain cargoes. The hundred-odd ships in the United States-flag tramp fleet are operated by some twenty to thirty independent or quasi-independent firms. Where there is frequent berth services, United States-flag liners may be able to handle a large proportion of the shipment as "bottom cargoes" without adding significantly to their costs. When rates are high or other business is slow, tankers may enter the grain trade to compete for shipments to Asia or Africa.

An adequate economic explanation is not available to support the apparent difference in tramp and supertanker rates for handling grains. The difference may reflect in part the attitudes of the Government's contracting officers,

who have applied a lower maximum guideline to shipments via large modern bulk carriers, and in part differences in operating costs. The offsetting cargo-handling costs flow from the needs of lighters to offload a portion of the deep-draft vessel's cargoes in certain ports and from the necessity for adequate facilities to warehouse their enormous cargoes (13).

Analysis of Tankship Freight Rates

Since there are inadequate studies available to show certain relationships that occur between supply, demand, shipbuilding and rate levels that exist in the grain trade it has been necessary to rely on two studies (9, 37) based on tanker operation in the oil trade. The oil trade appears to be quite similar in nature to that of the grain trade. Some of the similarities are:

1. Short-term rates are formed by the interaction of the demand schedule as affected by price expectation and the usual static supply schedule.
2. An increase or decrease in total demand for oil or grain, will affect all producers in more or less the same qualitative way because oil and grain are homogenous products.
3. Vessels operation in both trades are influenced by world events.

4. Presence of voyage and time chartered vessels.
5. Economies of scale are present.
6. Little can be done to increase capacity in the short run.
7. They are subject to the same degree of control.

When the world tanker fleet is fully employed, the only element of elasticity in the supply of transportation services by tankers consist in the possibility of changes in the degree of utilization of the fleet in response to changes in rates. This elasticity is strongly limited by the technical conditions of tanker operations.

The demand for tankship services are considered to be inelastic because (37):

1. Transportation is an input to a factor for which the demand is inelastic.
2. Ocean transportation is very specialized, hence, technically the substitution of other input factors for it is almost impossible.
3. The cost of transportation is only a small fraction of the total cost of the final product that uses it as an input.

Tanker freight rates fluctuate over a wide range. These fluctuations are extensive and spasmodic and sometimes take place within rather short periods. It appears that time charter rates show fluctuations which closely correspond to

those in voyage charter rates. Furthermore, the volume of time chartering also expands and contracts in accordance with the movements in rates. The incentive for time chartering is the anticipation, or even the anticipated possibility, of larger future transportation requirements, not the pressure of present needs (9).

The relative inelasticity of both supply and demand in years of prosperity explains the excessive fluctuations of tanker rates in response to changes in demand factors and supply factors in such periods. It appears that fluctuations in such demand factors as are connected with changes in demand for oils and in the location of production have generally been predominant in causing the year-to-year fluctuations in tanker rates, while the significance of the more gradually changing supply factors, in particular the transportation capacity, lies in their influence on the average level of rates over some consecutive years (9).

When a recession in demand leaves an appreciable part of the fleet idle, the elasticity of supply is greatly increased by the possibility of changes in the transportation capacity in employment. Rates fall to a level corresponding to the difference between the cost of operation and the cost of laying-up for the ships at the margin of employment. Accordingly, as long as a depression lasts, changes in demand or deliveries of new tankers lose nearly all of their

influence on tanker rates.

A high level of rates regularly leads to large-scale ordering of new tankers by each of the more important group of owners. Upon their completion about one year later, these ships have a depressing influence on the tanker freight market. Owing to this mechanism, rates show a tendency to develop in cycles, the shape of which is, however, greatly influenced by the course of demand factors (9).

During the ten years between 1949 and 1958, the tankship market went through two complete cycles. If we define a cycle as the period from trough to trough, we find that the first cycle lasted from July 1949 to July 1954, the second one from July 1954 to July 1958 (37).

Once rates start falling elastic expectations take over again. Buyers will interpret a fall in prices as a signal of future price declines of greater consequence. As a result, the operatives will at this point postpone orders of all kinds, thus prolonging the depression in the tanker service markets and also creating a future tonnage shortage which will give rise to another disturbance; therefore, a cyclical demand pattern is not necessary to the mechanism of cyclical rates. Changes in demand may bring about a change in the duration as well as in the intensity of the cycle but will not eliminate it. In addition, the suddenness and magnitude of the rate changes may influence the intensity of expecta-

tions, which, in turn, may influence the amplitude of the cycle (37).

A substantial price movement away from normal rates will create expectations that future rates will increase proportionately more than present prices. These expectations will then cause those in the market to change their purchasing plans, and shift their purchases from future to present periods.

The impact of expectations on the amounts of tanker services wanted at the various rates is immediate, but in the case of tankship building the increase in orders for new vessels will not be reflected in the available tankship capacity until sometime later because of the construction lead time. Given this difference in the timing of the impacts of rate expectations on the available supply and demand, it was concluded that short-term (spot) rates are formed by the interaction of the demand schedule as affected by price expectations[1] and the usual static supply schedule (37).

The tonnage demanded in the absence of price expectations was found to be virtually unaffected by price movements and it therefore attributed the difference between

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[1]The demand schedule as affected by price expectations will be referred to as a price expectation-quantity schedule which is a more appropriate name.

such infinite inelasticity and the elasticity of the empirical demand schedule to interperiod substitutions as caused by expectations (37).

An initial change in rates will generate expectations about future price changes and will thus cause shifts in purchases and chartering activities from future to current periods. These shifts, if we assume fixed supply, will cause further price increases, which in turn will affect expectations. In addition to movements along a price expectation-quantity schedule with positive slope,[1] consecutive shifts in the price expectation-quantity schedule may also occur, further aggravating price movements and chartering as well as shipbuilding activities. This spiral will continue until either expectations change from elastic to inelastic, the buyers withdraw from the market because of the negative budget effect, or the supply schedules shift and reverse the movement in rates. Once such a reversal occurs, prices will plummet. The drop in prices will automatically turn the speculative purchases into surpluses. Prices will then remain at very low levels, fluctuating below normal until the next disturbance occurs, caused

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[1] If expectations are elastic, the necessary mechanism for cyclical freight rates is established when the initial disturbance occurs. The increase in rates will generate interperiod substitutions which will make the price expectation-quantity schedule assume a positive slope (37).

either by normal attrition or accident, to repeat the cycle (37).

New orders placed and tie-ups were proven to be the most important factors affecting the supply schedule. The theoretical formulations showed that the changes in orders placed are governed mainly by two interperiod substitution effects and two static income effects, caused by changes in spot rates and tankship building costs. The two substitution effects are the result of expectations generated by spot rates and shipbuilding costs, respectively and they are positive or negative depending on the price elasticities of expectations in the tankship service and tankship building markets. The two income effects oppose each other, but the net result is expected to be positive, as long as spot rates increase, because of the greater price fluctuations in the tankship service market. The analysis shows that given price-elastic expectations, the majority of orders are placed during periods of very high spot-rate and shipbuilding cost levels, some at very low tankship building costs and excessively depressed tanker rates, and very few orders are placed during periods which one may consider as normal. Technological changes in tankship building normally appear during periods of depression, but even if this were not so, only when tanker rates are very low will technological obsolescence be manifested to threaten the economic life of

existing vessels. The impact of technology, therefore, is mostly incorporated in the orders for replacement, and this impact is normally surplus producing because of the increasing average size and efficiency of newer vessels (37).

The short-term supply schedule is infinitely inelastic beyond full capacity and extremely elastic below. The capacity that separates the elastic from the inelastic part of the short term supply schedule is not greater than 2 percent of the total (37).

The shape of the price expectation-quantity schedule in the region affected by interperiod substitutions will cause violent fluctuations in the spot rates above normal rates. Because of the extreme inelasticity of the supply schedule in this region, the fluctuations will be swift and extensive. Rates will remain at high levels until expectations, short-selling, or new capacity precipitate a downturn, and then they will slide continuously until they reach the tie-up cost of the marginal capacity. There, rates will remain fluctuating below normal rates until either shifts in demand or attrition eliminate the excess capacity and create shortages. When this takes place, spot rates will be forced above the full cost of the marginal vessel, will influence expectations, shifts in demand, etc. and will start another cycle (37).

ANALYSIS OF HEAVY GRAIN FREIGHT RATES AND EXPORT SHIPMENT DATA

The level of ocean freight rates for United States exports in relation to a competitor's freight rate will influence the competitive position of United States heavy grain exports. The level of freight rates will also influence the quantity of heavy grains exported. Many factors influence the level of freight rates and the subsequent quantity of heavy grain shipped from a particular country. Among the more important are the supply and demand for heavy grains. By analysis of the quantities exported from the United States, one can determine the major deficit areas of the world. With the realization of the demand areas, and knowledge of the larger supply areas, such as the United States, Canada, Argentina, and Australia, one realizes that transportation of heavy grains from the supply areas to the demand areas requires the moving of huge quantities of heavy grains many thousands of miles.

Distance is not as important in the determination of a marine freight rate as one might expect. In some trades, the proportion of terminal costs to total costs are well above 50 percent (7).

With the proportion of terminal costs high, all shippers are interested in efficient loading and unloading methods. Since ocean shipping operates like a decreasing cost industry as vessels get larger, shippers are interested in the utilization of the largest vessels available, and the utilization of this capacity to the utmost. However, restrictions are present in the shipping industry which prevent the utilization of the larger vessels, such as supply of such vessels, port restrictions in terms of depth of water, and the necessary equipment to unload the commodity at a fast rate. Therefore, the size of the vessel that may be employed may be limited by the capacity of the loading or unloading port, supply of vessels, and the supply and demand for the commodity transported.

To accomplish an analysis of the size of shipments, it was necessary to acquire a sample of shipments of United States heavy grain exports. Since approximately 70+ percent of the heavy grains exported from the United States between 1961 and 1966 was shipped via tramp vessels under voyage charters (4, 8), this procedure seems logical. The sample data was acquired from Maritime Research, Inc. (16, 17, 18) and consists of that portion of the heavy grain shipped via voyage chartered tramp vessels and reported to Maritime

Research, Inc. (16, 17, 18). Since reporting of the vessels chartered was not mandatory, the sample does not consist of all heavy grain shipped via voyaged chartered tramp vessels. In addition to quantity shipped, data on the freight rates and voyage charters were also collected.

Voyage charters may be classed into two general types in terms of areas of loading or unloading. One type names the specific port of loading or unloading and the second type names a range of loading or unloading possibilities. Any specific charter may possess the two general types, for example, it may name a specific port of loading such as Charleston and a range of unloading such as the West Coast of India.

In addition, many charters include provisions for certain services that are available at an additional charge. Such a service may be loading at more than one port. The addition of a charge for the extra service or option, tends to make freight rates associated with a particular trade route appear higher than what they actually are. An analysis of the extra charges associated with the employment of an option should yield some basic rate relationships between and among ports. The analysis of the extra charges also should yield an approximate charge for the various extra services in any one particular trade.

Options and many more factors influence the level of an

ocean freight rate. A change in any one factor may influence the level of the rate. Of the more important factors that do influence rates, three unregulated factors seem to be the most important, namely, political, military, and economic events, such as wars, famines, and revolts. Their direct influence would be the influencing of supply and demand for certain commodities and the supply and demand for ocean vessels.

Since many factors do influence the ocean shipping industry plus many being international in nature, the industry is very complex and competitive. A study of the industry must encompass a broad spectrum of factors and events. The following discussion will be concerned with a very narrow area of this broad spectrum. The area of concentration will be the ocean shipping of heavy grains. The study will be limited to the shipments shipped via voyage chartered vessels. The analysis will be divided into four general sections with divisions within each. The four general sections will be the collection of the data, analysis of the quantities of heavy grains exported, analysis of voyage charters, and the analysis of freight rates.

The collection of the data will be further divided into two parts, methodology and assumptions. Methodology will define the years the analysis covers, the origins and destinations of interest, the commodities included, and the terms

used. Several assumptions will be necessary to facilitate the collection of the data. Most assumptions will be concerned with factors such as options, the size of shipments, and time for which the charter was applicable.

Following the collection of the data, the sample data will be compared to the actual United States heavy grain exports for the same years so one can get an indication of the sample size and if it provides us with data for the more important trades. The average size of shipments in the sample will then be analyzed for all origins and destinations areas. The average size of shipment and a comparison of the sample to actual heavy grain exports will comprise the two divisions within the analysis of quantities of heavy grains exported.

The analysis of voyage charters will be divided into specific port charters and charter options. The naming of a specific port would indicate that there was a relative advantage or disadvantage in loading or unloading at that specific port. The advantage or disadvantage should also influence the freight rate. Also influencing the freight rates will be the employment of charter options.

The freight rates for heavy grains will be composed of two parts, one relating freight rates to political, economic, and military events, and the second, an analysis of the sample freight rates. The monthly weighted averages

will be derived as well as the yearly means for all trade routes. The freight rates will be grouped according to the type of vessel, the flag fleet to which it belongs, and the range from which the heavy grain was exported.

Collection of Data

Methodology

The study was limited to three years; 1958, 1966, and 1967. The limitation to three years was because of the large number of charters for each year and the cost associated with the collection and analysis of the data. The year, 1958 was selected because it was the year before the opening of the St. Lawrence Seaway. The years 1966 and 1967 were selected because more recent information was not available. Of particular interest in 1967 was the closing of the Suez Canal on June 6th, and its subsequent effect on ocean shipping.

The study was also limited to four heavy grains, those being wheat, soybeans, corn, and grain sorghum. Since over 70 percent of the heavy grains shipped between 1961 and 1966 (4, 8) were shipped via tramp vessels, the study was limited to tramp vessels under voyage charters. Both origin and destimation ports were usually grouped into port regions or countries. Those being for the United States; the Great

Lakes,[1] North Range,[2] Gulf,[3] and North Pacific.[4]

Throughout the study, rates associated with charters stating a specific port of loading will be referred to as specific port rates. Charters stating a particular region of loading will be referred to as regional quotes. Therefore, when referring to the total range quantity or fixtures, one must consider both regional charters and specific charters, which together represent the total for the complete range.

Table 1 lists the origins and destinations that were of concern to this study. The United States ports chosen were selected because they were the major grain exporting ports within their range. The destinations represent the major countries of the world which import a significant quantity of United States heavy grain.

Assumptions

In the acquisition of the freight rates and quantities of heavy grains shipped, the following were assumed:

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[1]Includes all United States ports located on the Great Lakes.

[2]East Coast of the United States, from Maine to the tip of Florida.

[3]Includes the West Coast of Florida and all ports using the Gulf of Mexico.

[4]Includes all of the West Coast of the United States.

Table 1. Port and port areas selected for the study

Origin	Destination
Great Lakes	South America
Chicago	Chile
Duluth	Peru
Toledo	Brazil
North Range	Venezuela
Albany	Caribbean
Baltimore	Haiti
Charleston	Southeast Asia
Norfolk	Philippines
Philadelphia	Madras, India
Gulf	India, East Coast of
Baton Rouge	Bombay, India
Beaumont	India, West Coast of
Brownsville	Japan
Corpus Christi	Africa
Destrehan	Union of South Africa
Galveston	Europe
Houston	Norway
Mobile	Italy
New Orleans	Hamburg
Pascagoula	Antwerp
North Pacific	Rotterdam
Long Beach	Antwerp, Rotterdam, or Amsterdam
Portland	United Kingdom
Sacramento	
San Francisco	
Stockton	

1. All shipments of heavy grain were delivered to the port or port area named in the fixture. That is, options to different ports or port areas were never activated.
2. Quantities of heavy grain shipped were the average of the range quoted. That is, for a fixture stating the quantity shipped as 19,000 plus or minus 5 percent,[1] it was assumed that 19,000 long tons were shipped. This differs from the Hutchinson (8) study, where he assumed that the lower limit was shipped. In the example given, he assumed that 18,050 long tons were shipped. The method used in the present study should estimate the actual tonnage more accurately.
3. Multiple port loading or discharging did not occur.
4. The freight rates were applicable for the date set for the loading of the vessel. Therefore, we assume that the date of the fixture had no effect on the freight rate agreed upon.
5. The port area, North Range, includes the entire East Coast of the United States.
6. Options to consecutive trip charters were never activated.

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[1]The range for this example is from 18,050 long tons to 19,950 long tons.

Quantities of Heavy Grains Exported for 1958, 1966, and 1967

A sample consists of a small collection from some large collection about which we seek information. The sample is examined and the facts about it learned. Based on these facts, the problem is to make correct inferences about the large collection or population. We observe the sample, but it is the population which we seek to know.

The population which we seek to know is the ocean shipping of heavy grain. The sample is a collection of data consisting of heavy grain shipments shipped via voyage chartered tramp vessels.

Comparison of actual exports to the sample

The following sector compares United States exports of heavy grain for 1958, 1966, and 1967 to the data collected. To further clarify the headings and labels used in Tables 2, 3, 4, and 5, each will be defined. Total exports were the actual United States heavy grain exports for that particular year. Sample exports were that quantity of heavy grains exported via tramp vessels operating under voyage charters and having originated at one of our origins and going to one of our selected destinations and listed in our source (16, 17, 18). The range total consists of all heavy grains exported from the entire range; for the sample, this

consists of both the port totals and the regional total. For the total exports, or actual exports, all quantities were listed in terms of the port of export. Port totals represent exports of heavy grain originating from that port. For the sample, these totals represent that quantity of heavy grain shipped under specific port charters. The regional total represents that portion of the sample that was shipped via voyage charters naming the region of loading. The final column informs us as to the percent of the total exports our sample consists of.

From Table 2 the sample data collected for 1958 consisted of 9,469,789 long tons which were exported from the United States aboard voyage chartered tramp vessels and were chartered to deliver at one of the selected destinations. This tonnage represented approximately 56.32 percent of the total heavy grains exported for that year. In 1966 the sample consisted of 25,816,785 long tons, but represented only 51.03 percent of the total exports. Our 1967 sample consisted of 22,955,524 long tons which increased the percentile to 52.24 percent of the total heavy grain exports. Of the total heavy grain exports, only 2.88 percent in 1958, 4.67 percent in 1966, and 5.38 percent in 1967 were exported from a specified port that was named in the charter party.

Tables 2, 3, 4, and 5 show some of the over-all changes

Table 2. A comparison of total yearly exports of heavy grain to the yearly sample total

Year	Total exports	Sample exports	$\frac{\text{Sample}}{\text{Total Exports}} \times 100 = \%$
1958			
Total Exports	16,813,280.42[ab]	9,469,789.00[bc]	56.32
Port Totals	14,077,003.26	484,300.00	2.88
1966			
Total Exports	50,594.627.01[bd]	25,816,785.00[be]	51.03
Port Totals	43,347,850.88	2,361,105.00	4.67
1967			
Total Exports	43,937,808.95[bf]	22,955,524.00[bg]	52.24
Port Totals	38,405,685.24	2,364,675.00	5.38

[a]U.S. Department of Commerce (32).

[b]All amounts are in long tons.

[c]Maritime Research, Inc. (16).

[d]U.S. Department of Commerce (33).

[e]Maritime Research, Inc. (17).

[f]U.S. Department of Commerce (31, 34).

[g]Maritime Research, Inc. (18).

in the heavy grain export trade. Total exports of heavy grains have increased three-fold from 1958 to 1966. The relative importance of each region has also changed. The major factor influencing this important change was the opening of the St. Lawrence Seaway. In 1958, before the Seaway was open, the Great Lakes exported 654,321.25 long tons of heavy grain, which constituted 3.89 percent of the yearly total. Eight years later it exported 6,200,390 long tons or 12.26 percent of the total. For 1967, 4,468,557.85 long tons or 10.17 percent of the total heavy grain exports originated from the Great Lakes, a decrease in both tonnage and percentile. The increased importance of the Great Lake range seems to be at the expense of the North Range. Exports of heavy grain originating in the North Range actually increased from 3,687,720.92 long tons in 1958 to 4,714,683.15 long tons in 1966, but decreased in 1967 to 3,818,492.51 long tons. Its relative percentage of the yearly total decreased from 21.93 percent in 1958 to 9.32 percent in 1966, and 8.69 percent in 1967.

The quantity of heavy grain exported from the Gulf increased from 9,935,175.98 long tons in 1958 to 33,312,339.36 long tons in 1966, but decreased in 1967 to 28,494,323.8 long tons. It also increased its share of the total heavy grain exports from 59.09 percent in 1958 to 65.84 percent in 1966. The 1967 percentage was down slightly, to 64.88.

Table 3. Export shipments of heavy grain; a comparison of the sample to the total United States exports of heavy grain for 1958

Origin	Total exports	Sample exports	$\frac{\text{Sample}}{\text{Total}} \times 100 = \%$
Great Lakes Total	654,321.25[ab]	0[bc]	0
Regional Total		0	0
Port Total	548,066.60	0	0
Chicago	376,582.22	0	0
Duluth	34,239.63	0	0
Toledo	137,244.75	0	0
North Range Total	3,687,720.92	1,482,250.00	40.19
Regional Total		1,153,650.00	
Port Total	3,199,158.53	328,600.00	
Albany	430,778.21	130,500.00	30.29
Baltimore	1,044,844.16	156,600.00	14.99
Charleston	22.31	9,500.00	0[d]
Norfolk	1,105,676.05	32,000.00	2.89
Philadelphia	617,837.80	0	0
Gulf Total	9,935,175.98	6,294,060.00	63.25
Regional Total		6,183,860.00	
Port Total	9,083.702.36	110,200.00	
Baton Rouge	1,266,695.29	0	0
Beaumont	0	0	0

[a]U.S. Department of Commerce (32).

[b]All amounts are in long tons.

[c]Maritime Research, Inc. (16).

[d]Sample quantity exceeds quantity of actual grain exports.

Table 3 (Continued)

Origin	Total exports	Sample exports	$\frac{\text{Sample}}{\text{Total}} \times 100 = \%$
Brownsville	0	0	0
Corpus Christi	533,133.61	0	0
Destrehan	3,997.24	0	0
Galveston	2,007,648.35	68,500.00	3.41
Houston	1,731,417.13	14,500.00	0.84
Mobile	738,261.97	12,200.00	1.65
New Orleans	2,800,275.58	15,000.00	0.54
Pascagoula	2,273.19	0	0
North Pacific Total	2,536,062.27	1,693,488.00	66.77
Regional Total		1,647,988.00	
Port Total	1,246,075.77	45,500.00	
Long Beach	8,250.01	0	0
Portland	1,063,349.35	9,500.00	0.89
Sacramento	0	0	0
San Francisco	32,215.71	36,000.00	-[d]
Stockton	142,260.70	0	0

Table 4. Export shipments of heavy grain; a comparison of the sample to the total United States exports of heavy grain for 1966

Origin	Total exports	Sample exports	$\frac{\text{Sample}}{\text{Total}} \times 100 = \%$
Great Lakes Total	6,200,390.00[ab]	1,945,100.00[abc]	31.37
Regional Total		1,175,750.00	
Port Total	4,107,144.68	769,350.00	
Chicago	1,957,859.79	265,600.00	13.57
Duluth	597,452.21	120,000.00	20.09
Toledo	1,551,832.68	383,750.00	24.73
North Range Total	4,714,683.15	2,102,050.00	44.58
Regional Total		1,603,550.00	
Port Total	4,531,937.39	498,500.00	
Albany	390,624.84	63,950.00	16.37
Baltimore	1,641,574.20	183,750.00	11.19
Charleston	247,425.38	96,500.00	39.00
Norfolk	1,523,705.03	71,300.00	4.68
Philadelphia	728,607.94	83,000.00	11.39
Gulf Total	33,312,339,36	17,598,302.00	52.82
Regional Total		16,977,047.00	
Port Total	31,500,737.18	621,255.00	
Baton Rouge	3,112,996.25	75,000.00	2.41
Beaumont	1,997,681.42	28,500.00	1.43
Brownsville	161,685.95	44,000.00	27.21

[a]U.S. Department of Commerce (33).

[b]All amounts are in long tons.

[c]Maritime Research, Inc. (17).

Table 4 (Continued)

Origin	Total exports	Sample exports	$\frac{\text{Sample}}{\text{Total}} \times 100 = \%$
Corpus Christi	2,595,080.06	0	0
Destrehan	5,375,910.54	99,500.00	1.85
Galveston	2,829,734.38	129,000.00	4.56
Houston	6,208,323.25	22,780.00	0.37
Mobile	810,411.62	0	0
New Orleans	6,211,537.84	112,475.00	1.81
Pascagoula	2,197,375.87	110,000.00	5.01
North Pacific Total	6,367,214.50	4,171,333.00	65.51
Regional Total		3,699,333.00	
Port Total	3,208,031.63	472,000.00	
Long Beach	914,499.50	426,000.00	46.58
Portland	2,081,592.21	0	0
Sacramento	800.00	0	0
San Francisco	16,760.83	0	0
Stockton	195,171.09	46,000.00	23.57

Table 5. Export shipments of heavy grain; a comparison of the sample to the total United States exports of heavy grain for 1967

Origin	Total exports	Sample exports	$\frac{\text{Sample}}{\text{Total}} \times 100 = \%$
Great Lakes Total	4,468,557.85[abc]	1,664,809.00[bd]	37.26
Regional Total		1,271,809.00	
Port Total	3,216,585.84	383,000.00	
Chicago	1,438,987.42	63,000.00	4.37
Duluth	393,327.14	58,700.00	14.92
Toledo	1,384,271.28	271,300.00	19.59
North Range Total	3,818,492.51	2,101,550.00	55.03
Regional Total		1,504,650.00	
Port Total	3,658,442.94	596,900.00	
Albany	257,101.78	0	0
Baltimore	803,933,87	115,000.00	14.30
Charleston	423,299,47	224,200.00	52.96
Norfolk	1,547,158.08	206,700.00	13.35
Philadelphia	626,949,74	51,000.00	8.13
Gulf Total	28,494,323.80	15,475,745.00	54.31
Regional Total		14,382,070.00	
Port Total	27,937,998.73	1,093,675.00	
Baton Rouge	3,326,526.11	45,980.00	1.38

[a]U.S. Department of Commerce (31, 34).

[b]All amounts are in long tons.

[c]19,670.42 long tons of grain sorghum could not be assigned from source (31) to a range.

[d]Maritime Research, Inc. (18).

Table 5 (Continued)

Origin	Total exports	Sample exports	$\frac{\text{Sample}}{\text{Total}} \times 100 = \%$
Beaumont	1,144,837.69	0	0
Brownsville	508,810.60	320,300.00	62.95
Corpus Christi	1,482,273.86	69,500.00	4.68
Destrehan	7,526,905.90	62,000.00	0.82
Houston	4,251,398.27	78,000.00	1.83
Mobile	488,231.14	80,100.00	16.40
New Orleans	5,952,976.78	197,300.00	3.31
Pascagoula	2,442,616.85	179,000.00	7.32
North Pacific Total	7,136,764.23	3,713,420.00	52.03
Regional Total		1,348,745.00	
Port Total	3,592,657.73	2,364,675.00	
Long Beach	578,482.06	169,100.00	29.23
Portland	2,651,412.41	0	0
Sacramento	168,023.24	15,000.00	8.92
San Francisco	36,180.90	24,000.00	66.33
Stockton	158,559.12	73,000.00	46.03

The North Pacific, although increasing the total amount exported from 2,536,062.27 long tons in 1958 to 6,367,214.50 in 1966, decreased its share of the total heavy grain exports from 15.08 percent in 1958 to 12.58 percent in 1966. In 1967, the North Pacific increased its tonnage to 7,136,764.23 and its percentage to 16.25. It was the only region that increased tonnage or percentage in 1967.

The great relative importance of the Gulf region possibly can be attributed to the availability of cheap water transportation on the Mississippi and the availability of excellent loading facilities. Cheap rail rates also have had some influence.

The influence on the Gulf region of the opening of the St. Lawrence Seaway has not lived up to expectations.[1] Again, cheap water rates and cheap rail rates to Gulf ports have somewhat equalized the advantages that many experts felt the Great Lakes ports would acquire with the opening of the Seaway. Some minor factors also to consider in the Great Lakes were the limit placed on vessel size and delays

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[1]Jorgenson, Robert K. City of Milwaukee, Board of Harbor Commissioners, Milwaukee, Wisconsin. Information on St. Lawrence Seaway expectations. Private Communication. 1968.

associated with the navigation of the lock system.

Great Lakes In 1958, no voyage charters for heavy grain via tramp vessels were recorded, due to the fact that the St. Lawrence Seaway was not yet complete and the grain had to be transshipped from lake carriers to ocean going vessels. Of the total heavy grain exports from the Great Lakes range for 1966 and 1967, the sample consisted on only 31.37 and 37.26 percent of the total grain exports, respectively. The most apparent reason for this small percentage was the fact that much of the heavy grain exported from the Great Lakes range was shipped to St. Lawrence ports where it was used to fill ocean going vessels to capacity. The practice is made necessary because of the Seaways limited depth.[1]

The naming of the specific port of loading was more common in the Great Lakes range than any other range. The logical explanation was that due to the shape of the Great Lakes, the location of the port of loading would have more effect on costs than any other range. Differing costs should be reflected in the freight rate.

North Range The sample for the North Range consists of 40.19 percent of the actual North Range heavy

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[1]The Seaway cannot accommodate vessels drawing more than 25.5 feet of water (24).

grain exports for 1958. In 1966, it consisted of 44.58 percent, but declined to 37.26 percent in 1967.

Gulf The sample for the Gulf comprises 63.25, 52.82, and 54.31 percent of the yearly exports of heavy grain from the Gulf in 1958, 1966, and 1967, respectively.

North Pacific The reason why the 1958 and 1966 sample was larger with respect to the total heavy grain exports of the range than any other range was not known. We have accounted for 66.77 percent of the 1958 exports of heavy grain and 65.51 percent of the 1966 exports. The percentage for 1967 was lower with the sample representing 52.03 percent of the total exports.

Shipment size

Since size of vessel does influence cost, it seems logical that size of shipment should influence freight rates. From Table 6 we see that the size of the average shipment has increased in the last ten years. The largest average was for shipments originating from the Gulf. Size of shipments was influenced by the ability of loading and unloading facilities and their associated harbors to accommodate large vessels, the use of lighters, and the presence of tankers.

Table 7 shows the draft for the selected United States

ports and destinations. A 15,000 D.W.T.[1] vessel can enter any of the selected origins or destinations. A 30,000 D.W.T. vessel requires a draft of 28 feet and a 55,000 D.W.T. vessel requires a draft of 38 feet.[2]

By comparing Tables 8 and 9 we can determine the importance of the regions of export and the average size of the shipments for each foreign destination. Size of shipments to Peru, Venezuela, and Haiti, although originating mainly from the Gulf were far below the Gulf's average. This would indicate that the limiting factor must be either the foreign port's capacity or the demand for heavy grain.

Shipments to the United Kingdom were smaller in size than to other European ports, thus the capacity of the ports of the United Kingdom must be the limiting factor. The origin of such shipments may also influence size of shipments to some extent.

Another interesting difference of shipment size was prevalent in the Indian trade. Bombay's average size shipment for 1958, 1966, and 1967 was 13,620, 19,895, and 19,723 long tons, respectively. The average size of the shipments to the West Coast, excluding Bombay for the same years were

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[1]Dead weight ton.

[2]Davis, LeRoy (4).

Table 6. Average size of the heavy grain shipments for the four export regions for the years 1958, 1966, and 1967

Year	Port Region				Weighted yearly average
	Great Lakes	North Range	Gulf	North Pacific	
1958[a]	0[b]	10.465	11.465	11.289	11.247
1966[c]	12.311	15.357	28.615	16.752	17.698
1967[d]	14.864	15.921	21.112	11.219	19.003

[a]Maritime Research, Inc. (16).

[b]All amounts are in thousands of long tons.

[c]Maritime Research, Inc. (17).

[d]Maritime Research, Inc. (18).

10,476, 12,682, and 13,019 long tons. The average size of shipment in these two trades do appear to influence freight rates as will be noted later.

On the East Coast of India, Madras' average shipment size was 21,000 and 20,227 long tons for 1966 and 1967, respectively. For the East Coast, excluding Madras, the average size was 9,818, 16,167, and 20,482 long tons for 1958, 1966, and 1967. The size of shipments to the East Coast was larger than the shipments to the West Coast. This was due to the presence of tankers in the East Coast trade.

Table 7. Draft of origin and destination ports[a]

Origin Ports	Draft	Destination Ports	Draft
Great Lakes		Chile	30[b]
Chicago	26.5[b]	Peru	32[b]
Duluth	26.5[b]	Brazil	30[b]
Toledo	26.5[b]	Venezuela	30[b]
		Haiti	38[b]
North Range		Philippines	30[b]
Albany	27[b]	Madras, India	X[c]
Baltimore	35[b]	East Coast of India	30[b]
Charleston	35[b]	Bombay	35[d]
Norfolk	34[b]	West Coast of India	35[b]
Philadelphia	33[b]	Japan	37[b]
		Union of South Africa	35[b]
Gulf		Norway	33[b]
Baton Rouge	40[d]	Italy	32[b]
Brownsville	38[d]	Hamburg	32-33[d]
Corpus Christi	36[b]	Antwerp	38-40[d]
Destrehan	40[d]	Rotterdam	38-40[d]
Galveston	34.5[b]	Antwerp, Rotterdam, or Amsterdam	38-40[d]
Houston	40[b]	United Kingdom	32[b]
Mobile	39[b]		
New Orleans	40[d]		
Pascagoula	39[d]		
Beaumont	36[d]		
North Pacific			
Long Beach	Unlimited[d]		
Stockton	32[d]		
Sacramento	30[d]		
San Francisco	32[d]		
Portland	35[d]		

[a]Drafts are in feet.

[b]Davis, Leroy (4).

[c]"X" data was not available.

[d]Finlayson, John. Cooke and Company, Grain Division, Memphis, Tenn. Data on depth. Private Communication. 1969.

Table 8. The percent of heavy grain shipments originating from the four export regions of the U.S. for the selected destinations for the years 1958, 1966, and 1967

Destination	Year	Port Regions			
		Great Lakes	North Range	Gulf	North Pacific
Chile	1958[a]	0	0	0	0
	1966[b]	0	0	92.0	8.0
	1967[c]	0	0	48.432	51.568
Peru	1958	0	0	100.000	0
	1966	0	0	100.000	0
	1967	0	0	100.000	0
Venezuela	1958	0	35.849	64.150	0
	1966	12.442	11.817	75.741	0
	1967	0	18.301	73.451	8.247
Haiti	1958	0	0	0	0
	1966	0	0	100.000	0
	1967	0	0	100.000	0
Philippines	1958	0	0	0	0
	1966	0	0	0	100.000
	1967	0	0	6.278	93.722
Madras, India	1958	0	0	0	0
	1966	0	0	100.000	0
	1967	0	0	90.112	9.888
Union of South Africa	1958	0	0	0	0
	1966	7.892	3.991	88.117	0
	1967	25.0	0	75.000	0

[a]Maritime Research, Inc. (16).

[b]Maritime Research, Inc. (17).

[c]Maritime Research, Inc. (18).

Table 8 (Continued)

Destination	Year	Port Regions			
		Great Lakes	North Range	Gulf	North Pacific
Hamburg	1958	0	46.479	53.521	0
	1966	17.225	0	80.628	2.147
	1967	15.148	7.289	72.889	4.674
Norway	1958	0	0	100.000	0
	1966	7.163	7.163	69.146	16.529
	1967	0	20.000	80.000	0
Italy	1958	0	9.865	90.135	0
	1966	25.844	3.843	70.313	0
	1967	10.000	8.442	81.558	0
Antwerp	1958	0	11.108	83.351	5.541
	1966	23.628	2.976	73.397	0
	1967	13.671	1.846	84.484	0
Rotterdam	1958	0	15.911	68.517	15.572
	1966	8.083	7.141	83.189	1.588
	1967	8.012	12.309	79.679	0
East Coast of India	1958	0	11.729	29.332	58.878
	1966	0	10.137	35.320	54.543
	1967	0	14.352	43.157	42.491
United Kingdom	1958	0	16.866	83.134	0
	1966	33.370	28.808	37.822	0
	1967	25.729	57.484	16.787	0
Brazil	1958	0	0	100.000	0
	1966	0	6.509	93.491	0
	1967	0	0.985	99.015	0
Amsterdam, Rotterdam, Antwerp	1958	0	39.855	60.144	0
	1966	19.088	1.620	78.767	0.526
	1967	30.730	3.248	66.023	0
West Coast of India	1958	0	81.320	18.680	0
	1966	1.612	20.481	77.585	0.501
	1967	4.389	10.153	84.554	0.904

Table 8 (Continued)

Destination	Year	Port Regions			
		Great Lakes	North Range	Gulf	North Pacific
Japan	1958	0	1.970	58.034	39.996
	1966	1.480	0.236	60.449	37.835
	1967	1.128	0	60.186	38.686
Bombay, India	1958	0	13.705	55.115	31.180
	1966	0	16.049	68.570	15.381
	1967	0.885	3.922	76.409	18.784

Table 9. The average size of the shipments from the four export regions to selected destinations

Destination	Year	Port Region				Weighted yearly ave.
		Great Lakes	North Range	Gulf	North Pacific	
Chile	1958[a]	0[b]	0	0	0	
	1966[c]	0	0	14.091	13.500	14.042
	1967[d]	0	0	11.583	12.333	11.958
Peru	1958	0	0	9.916	0	9.916
	1966	0	0	10.080	0	10.080
	1967	0	0	12.900	0	12.900
Venezuela	1958	0	9.500	17.000	0	13.250
	1966	10.2	9.688	9.199	0	9.369
	1967	0	7.671	8.289	12.100	8.384

[a]Maritime Research, Inc. (16).

[b]All amounts are in thousands of long tons.

[c]Maritime Research, Inc. (17).

[d]Maritime Research, Inc. (18).

Table 9 (Continued)

Destination	Year	Port Region				Weighted yearly ave.
		Great Lakes	North Range	Gulf	North Pacific	
Haiti	1958	0	0	0	0	0
	1966	0	0	9.644	0	9.644
	1967	0	0	10.419	0	10.419
Philippines	1958	0	0	0	0	0
	1966	0	0	0	16.588	16.588
	1967	0	0	12.100	15.709	14.420
Madras, India	1958	0	0	0	0	0
	1966	0	0	21.000	0	21.000
	1967	0	0	20.050	22.000	20.227
Union of South Africa	1958	0	0	0	0	0
	1966	14.500	22.000	20.375	0	19.686
	1967	15.000	0	15.000	0	15.000
Hamburg	1958	0	9.429	19.000	0	12.909
	1966	11.700	0	24.341	17.500	20.378
	1967	11.950	23.000	19.167	14.750	17.531
Norway	1958	0	0	8.500	0	8.500
	1966	13.000	13.000	15.688	15.000	15.125
	1967	0	15.500	17.714	0	17.222
Italy	1958	0	11.000	9.136	0	9.292
	1966	10.471	10.900	17.341	0	14.545
	1967	9.240	19.500	15.072	0	14.438
Antwerp	1958	0	12.171	12.043	12.142	12.062
	1966	10.720	13.500	20.813	0	16.804
	1967	12.500	13.500	26.870	0	22.859
Rotterdam	1958	0	11.750	14.457	11.500	13.427
	1966	13.624	16.850	26.290	18.733	23.441
	1967	16.526	19.233	30.210	0	26.580
East Coast of India	1958	0	8.769	9.503	10.230	9.818
	1966	0	29.500	16.579	14.697	16.167
	1967	0	21.883	25.750	16.660	20.482
United Kingdom	1958	0	9.112	9.907	0	9.823
	1966	10.387	13.321	13.024	0	11.989
	1967	11.258	14.121	13.826	0	13.210

Table 9 (Continued)

Destination	Year	Port Region				Weighted yearly ave.
		Great Lakes	North Range	Gulf	North Pacific	
Brazil	1958	0	0	11.921	0	11.921
	1966	0	16.825	16.959	0	16.950
	1967	0	9.500	14.462	0	14.388
Antwerp,	1958	0	13.750	20.750	0	17.250
Rotterdam	1966	16.158	21.250	29.529	13.800	25.233
Amsterdam	1967	19.626	18.667	30.770	0	25.737
West Coast of	1958	0	10.513	10.318	0	10.476
India	1966	10.833	11.162	13.224	10.100	12.682
	1967	17.000	13.108	12.843	14.000	13.019
Japan	1958	0	10.400	11.634	10.921	11.312
	1966	13.429	15.000	19.202	17.048	18.204
	1967	13.200	0	23.965	15.616	19.708
Bombay, India	1958	0	10.769	14.075	14.477	13.620
	1966	0	21.287	19.645	19.671	19.895
	1967	18.500	20.500	19.720	19.635	19.723

Table 10. Average size of shipments of heavy grain originating from ports named in voyage charters

Port of Loading	Year		
	1958	1966	1967
Great Lakes			
Chicago	0[ab]	11.067[c]	9.0[d]
Duluth	0	13.333	14.675
Toledo	0	11.629	14.279

[a]Maritime Research, Inc. (16).

[b]All amounts are in thousands of long tons.

[c]Maritime Research, Inc. (17).

[d]Maritime Research, Inc. (18).

Table 10 (Continued)

Port of Loading	Year		
	1958	1966	1967
North Range			
Albany	10.875	10.658	24.000
Baltimore	9.786	20.417	16.428
Charleston	9.500	13.786	16.657
Norfolk	10.667	14.260	15.900
Philadelphia	0	13.833	12.750
Gulf			
Baton Rouge	0	37.500	22.988
Brownsville	0	22.000	22.879
Corpus Christi	0	0	17.375
Destrehan	0	24.875	31.000
Galveston	13.700	18.428	20.500
Houston	14.500	7.593	39.000
Mobile	12.200	0	26.700
New Orleans	15.000	18.745	17.936
Pascagoula	0	36.667	35.800
Beaumont	0	28.500	0
North Pacific			
Long Beach	0	25.188	21.137
Stockton	0	23.000	24.333
Sacramento	0	0	15.000
San Francisco	12.000	0	24.000
Portland	9.500	0	0

Table 11. Range of shipment size for United States ports[a]

Origin	Year		
	1958	1966	1967
Great Lakes			
Chicago		5.0-26.5[b]	7.0-13.5[c]
Duluth		8.5-25.0	5.6-18.5
Toledo		7.7-15.0	7.0-26.0
North Range			
Albany	9.0-19.0[d]	8.5-15.0	24.0
Baltimore	3.5-14.0	14.5-42.0	9.5-21.0
Charleston	9.5	10.5-17.5	5.0-23.0
Norfolk	9.5-11.5	9.0-20.0	5.2-32.0
Philadelphia	-	10.0-21.0	9.5-15.5
Gulf			
Baton Rouge	-	-	3.0-43.0
Beaumont	-	28.5	-
Brownsville	-	21.0-23.0	14.3-32.0
Corpus Christi	-	-	10.0-23.5
Destrehan	-	15.0-40.0	13.0-32.0
Galveston	9.5-20.0	7.0-30.0	21.0-33.0
Houston	14.5	4.0-14.0	17.5-44.0
Mobile	12.2	-	3.1-47.0
New Orleans	15.0	11.3-40.0	3.5-34.0
Pascagoula	-	32.0-42.0	20.0-46.0
North Pacific			
Long Beach	-	15.0-33.0	10.0-30.0
Portland	9.5	-	-
Sacramento	-	-	15.0
San Francisco	9.5-14.0	-	24.0
Stockton	-	23.0	24.0-25.0

[a]All amounts are in thousands of long tons.

[b]Maritime Research, Inc. (17).

[c]Maritime Research, Inc. (18).

[d]Maritime Research, Inc. (16).

Table 12. Range of shipment size for selected destinations[a]

Destination	Year		
	1958	1966	1967
Chile	-	10.0-26.0[b]	10.0-16.0[c]
Peru	5.0-15.0[d]	5.0-20.0	5.0-19.0
Brazil	3.0-20.0	10.0-30.0	3.1-41.0
Venezuela	9.5-17.0	5.0-13.1	2.6-14.2
Haiti	-	7.0-11.9	7.1-13.8
Philippines	-	11.0-24.0	10.0-27.5
Madras, India	-	20.0-24.0	9.7-33.0
East Coast of India	5.0-15.0	9.2-72.5	10.0-99.5
Bombay, India	4.5-28.0	10.0-34.5	10.0-34.0
West Coast of India	8.5-12.5	5.0-63.0	9.5-33.0
Japan	7.0-19.0	8.0-32.5	12.0-34.0
Union of South Africa	-	14.0-25.0	14.0-17.0
Norway	8.4-9.5	13.0-25.0	13.0-25.0
Italy	5.0-10.0	8.7-30.0	4.0-21.5
Hamburg	9.5-35.0	9.0-60.0	6.5-31.5
Antwerp	8.5-37.0	9.0-38.0	9.0-50.0
Rotterdam	9.0-23.0	8.5-60.0	9.8-51.0
Antwerp, Rotterdam, or Amsterdam	13.5-22.5	6.0-55.0	9.8-42.0
United Kingdom	5.5-16.5	3.4-18.5	4.2-23.0

[a] All amounts are in thousands of long tons.

[b] Maritime Research, Inc. (17).

[c] Maritime Research, Inc. (18).

[d] Maritime Research, Inc. (16).

From Table 10 the average size of the shipments originating from a specific United States port can be evaluated. Since size of shipments has an effect on cost, there should be a correlation between the smallest average shipment size and high rates. If this were true, Chicago, Philadelphia, Corpus Christi, New Orleans, and Sacramento should be the high cost ports for their respective ranges.

The average size of shipments of heavy grains may be misleading in terms of actual shipment size. Table 11 contains the size range of shipments for specific origin ports. Table 12 contains the same information for the selected destinations.

Voyage Charters

A voyage charter is made for a certain voyage or series of voyages. Each charter is an unique agreement with its own terms and provisions, such as who pays for the unloading, who pays the port charges, how many days are allowed for loading or unloading, what port or port range to load or unload, just to mention a few. In the following two sectors, two areas of a voyage charter will be surveyed with the areas being the importance of specific port charters and the charges associated with certain charter options.

Specific port charters

From Table 13 it should be noted that the naming of specific ports of loading was more prevalent in some trade routes than in others. Of the heavy grain exports destined for Hamburg, 60.563, 25.972, and 29.472 percent for 1958, 1966, and 1967, respectively, were so destined aboard vessels employed under voyage charter which named the specific port of loading. For Italy, 9.865, 16.271, and 7.792 percent for the same three years were shipped under the same type charter. Of Antwerp's total imports of heavy grain from the United States, 3.046, 13.996, and 14.900 percent for the same three years were shipped via the same type charter. Of the heavy grain exports destined for Rotterdam, 40.758, 14.876, and 22.878 percent for 1958, 1966, and 1967, respectively, were shipped via charters naming the specific port of loading. For the United Kingdom, 6.096, 33.145, and 15.676 percent were so shipped.

Only two non-European destinations showed an appreciable amount of United States heavy grain imports originating from a named port of loading. The two countries, Venezuela and Japan, had 0.0, 14.035, 19.179, and 2.791, 9.058, 5.751 percent for the three years, respectively.

The rationale for the presence of charters naming the specific port of loading in one trade route and not in another is not known. A logical reason may be that in the trades

Table 13. Percentage of United States heavy grain imports shipped via voyage charters naming the specific port of loading in the United States

Importing Area	Year		
	1958	1966	1967
Chile	0[a]	0[b]	29.268[c]
Peru	0	5.787	0
Venezuela	0	14.035	19.179
Haiti	0	0	0
Philippines	0	0	0
Madras, India	0	0	0
Union of South Africa	0	5.352	25.000
Hamburg	60.563	25.972	29.472
Norway	0	21.212	0
Italy	9.865	16.271	7.792
Antwerp	3.046	13.996	14.900
Rotterdam	40.758	14.876	22.878
East Coast of India	2.418	0	0
United Kingdom	6.096	33.145	15.676
Brazil	8.609	2.184	0.985
Antwerp, Rotterdam, Amsterdam	0	5.621	11.343
West Coast of India	3.127	0.422	3.421
Japan	2.791	9.058	5.751
Bombay, India	2.203	1.173	1.937

[a]Maritime Research, Inc. (16).

[b]Maritime Research, Inc. (17).

[c]Maritime Research, Inc. (18).

where it was used the most, the majority of the heavy grain was shipped by private firms. Private firms have facilities in only certain ports of loading, therefore, the use of a voyage charter naming the specific port of loading may be advantageous.

For the trade routes where voyage charters naming the specific port of loading were absent, at least part of the heavy grain shipped was under government programs. Grain exported under government programs may originate from a variety of sources--government storage, private firms, direct from the harvest field; thus, the source of a particular shipload of heavy grain may not be known at the time the vessel is chartered with the result being the naming of the range loading area. The specific port of loading is named later as the availability of grain and facilities is determined.

From Table 14 note the importance of the port charter for the four port regions of the United States. The Great Lakes and the North Range exported roughly 25 percent of their total heavy grain exports via such chartered vessels. The percentage shipped as such was much lower for the Gulf and North Pacific. The overall trend seems to indicate an increase in the use of specific port charters.

The reason for the difference of importance of voyage charters naming specific ports of loading for the different port regions was not readily recognizable. The apparent

Table 14. A comparison of the percentage of United States heavy grain exports shipped via voyage charters stating the specific port of loading and those charters stating the region of loading for the four export regions for 1958, 1966, and 1967

Year and charter type	Port Regions				Yearly percent
	Great Lakes	North Range	Gulf	North Pacific	
1958					
Specific port of loading	0[a]	22.169	1.751	2.687	5.114
Regional loading	0	77.831	98.249	97.313	94.886
1966					
Specific port of loading	39.553[b]	23.222	3.530	11.315	9.098
Regional loading	60.553	76.778	96.469	88.684	90.901
1967					
Specific port of loading	23.606[c]	28.403	7.067	7.570	10.301
Regional loading	76.393	71.597	92.932	92.430	89.698

[a]Maritime Research, Inc. (16).

[b]Maritime Research, Inc. (17).

[c]Maritime Research, Inc. (18).

justification for the naming of a specific port in the Great Lakes was the additional expense incurred in reaching one port as compared to another. This would appear to be true due to the shape of the Great Lakes and the location of the important ports.

Some of the North Range ports, due to their geographic location and population, appear to be more susceptible to congestion than other ports. Congestion leads to more days in port, thus more expense for the shipowner. This additional expense will result in higher freight rates for the more congested ports. Also, heavy grain exports from both port regions are done mainly by private firms. As private firms may have facilities in certain ports, the result may be a specific port charter.

Analysis of charter options

In addition to the usual provisions, many charters carry options such as load two ports, deliver two ports, load or deliver alternate ports or ranges. The costs associated with these alternatives would seem to be an excellent source of some of the basic cost relationships present in the ocean shipping industry. These costs are presented in Tables 15 and 16. Table 15 summarizes the options that were available to some charterers at the time of loading. Table 16 summarizes the options that were available for at least one charterer at the destinations.

Table 15. Costs of options available to charterers at time of loading[a]

Origin of shipment	Destination	Cost of options
Great Lakes	United Kingdom	Load Lake Eire - $.35[b] extra, via Foreign Flag Vessels.
Chicago	Japan	Load Toledo - $.50 less, via Foreign Flag Vessels.
	Manchester, England	Load Toledo - $1.05 less, via Foreign Flag Vessels.
Duluth	United Kingdom	Load Toledo - $1.05 less, via Foreign Flag Vessels.
North Range	Bombay, India	Load Gulf - $1.25 to $.68 extra, via American Flag Vessels. $.35 extra via Foreign Flag Vessels.
	India's East Coast	Load Gulf - $1.50 extra, via American Flag Vessels.
		Load Albany, New York - $.35 extra, via Foreign Flag Vessels.
	India's West Coast	Load Albany, New York - $.35 extra, via Foreign Flag Vessels.
		Load Gulf - $.35 extra, via Foreign Flag Vessels.
		Load New York City - $.35 extra via Foreign Falg Vessels.

[a]Maritime Research, Inc. (16, 17, 18).

[b]All costs are per long ton.

Table 15 (Continued)

Origin of shipment	Destination	Cost of options
	United Kingdom	Load Gulf - $.42 to $.63 extra, via Foreign Flag Vessels.
		Load Albany - $.18 extra, via Foreign Flag Vessels.
	Santos, Brazil	Load Albany - $.50 extra, via Foreign Flag Vessels.
	Rotterdam	Load Gulf - $.95 extra, via Foreign Flag Vessels.
Baltimore, Maryland	United Kingdom	Load Norfolk - $.14 extra, via Foreign Flag Vessels.
Gulf	Bombay, India	Load North Range - $.28 to $.35 less, via Foreign Flag Vessels.
		Load North Pacific - $.35 less, via Foreign Flag Vessels.
	India's West Coast	Load North Range - $.25 to $.63 less, via Foreign Flag Vessels.
	Japan	Load two ports - $.35 extra, via Foreign Flag Vessels.
	Rotterdam	Load North Range - $.50 to $.75 less, via Foreign Flag Vessels.
	Venezuela	Load North Range - $.25 less, via Foreign Flag Vessels.
	United Kingdom	Load Baton Rouge - $.18 less, via Foreign Flag Vessels.
	Hull	Load North Range - $.56 to $.81 less, via Foreign Flag Vessels.
	Mersey	Load Albany - $.70 less, via Foreign Flag Vessels.

Table 15 (Continued)

Origin of shipment	Destination	Cost of options
Destrehan	Hamburg	Load two ports - $.25 extra, via Foreign Flag Vessels.
North Pacific	India's East Coast	Load San Francisco - $.70 extra, via Foreign Flag Vessels.
	Rotterdam	Load San Francisco - $.25 to $.50 extra, via Foreign Flag Vessels.
		Load Stockton - $.25 to $.50 extra, via Foreign Flag Vessels.

Table 16. Costs of options available to charters at destination[a]

Country of destination	Origin of shipment	Cost of options
Japan	North Pacific Gulf	Delivery to Hadadate, Hokkaido, or Otaru were from 25¢ to 50¢[b] higher than delivery to other Japanese ports.
Bombay, India	North Range	Delivery to Calcutta - $5.95 to $9.95 extra, via American Flag Ships. Delivery to Madras - $.75 to $2.45 extra, via American Flag Ships.

[a]Maritime Research, Inc. (16, 17, 18).

[b]All costs are per long ton.

Table 16 (Continued)

Country of destination	Origin of shipment	Cost of options
	Gulf	Delivery to Madras - $1.48 to $2.00 extra, via American Flag Vessels. Delivery to Madras - $.70 less, via Foreign Flag Vessels. Free Delivery, $1.05 less than Gross Terms. Delivery to Calcutta via lighterage - $5.00 to $6.50 extra, via American Flag Vessels. Delivery via Cape - $3.00 to $5.00 extra, via American Flag Vessels.
	North Pacific	Delivery to Madras - $.35 less, via Foreign Flag Vessels. Delivery to Calcutta via lighterage - $4.00 extra via American Flag Vessels.
India's West Coast	North Range	Delivery to India's East Coast - $2.50 extra, via American Flag Vessels. $.35 extra, via Foreign Flag Vessels. Delivery to Madras - $2.60 extra, via American Flag Vessels.
	Gulf	Delivery to India's East Coast - $.35 extra, via Foreign Flag Vessels. $1.60 extra, via American Flag Vessels. Delivery to Madras - $.35 extra, via Foreign Flag Vessels. Free Delivery, $1.05 less than Gross Terms Delivery. Delivery via Cape - $1.96 extra, via Foreign Flag Vessels.
India's East Coast	Gulf	Delivery to Calcutta - $.14 extra, via Foreign Flag Vessels.

Table 16 (Continued)

Country of destination	Origin of shipment	Cost of options
	North Pacific	Delivery to India's West Coast - $.35 extra, via Foreign Flag Vessels.
Madras, India	North Pacific	Delivery to Kandla - $.35 extra, via Foreign Flag Vessels.
Calcutta, India	North Pacific	Delivery to Bombay - $3.25 less, via American Flag Vessels. Delivery to Bombay or Kandla - $5.97 less, via American Flag Vessels.
United Kingdom	Great Lakes	
Mersey		Delivery to Birkenhead - $.70 extra, via Foreign Flag Vessels.
Manchester		Delivery to the West Coast of the United Kingdom - $.35 extra, via Foreign Flag Vessels. Delivery to the East Coast of the United Kingdom - $.35 extra, via Foreign Flag Vessels.
London		Delivery to Hull - $.18 extra, via Foreign Flag Vessels.
London, Avonmouth, or Belfast		Delivery to Mersey, Hull, or Liverpool - $.18 extra, via Foreign Flag Vessels.
United Kingdom	North Range	
	Baltimore	Delivery to Mersey - $.21 extra, via Foreign Flag Vessels.
London	North Range	Delivery to Hull - $.18 extra, via Foreign Flag Vessels.

Table 16 (Continued)

Country of destination	Origin of shipment	Cost of options
	Belfast	Delivery to Hull - $.35 extra, via Foreign Flag Vessels. Delivery to Avonmouth or Glasgow - $.18 extra, via Foreign Flag Vessels.
United Kingdom Gulf		Delivery to Manchester - $.18 extra, via Foreign Flag Vessels.
	Avonmouth	Delivery to Liverpool - $.07 extra, via Foreign Flag Vessels. Delivery to Birkenhead - $.07 extra, via Foreign Flag Vessels. Delivery to Belfast - $.0 extra, via Foreign Flag Vessels.
United Kingdom Gulf		
	London	Delivery to Hull - $.14 extra, via Foreign Flag Vessels.
	Glasgow or Avonmouth	Delivery to Mersey - from $.18 to $.28 extra, via Foreign Flag Vessels.
United Kingdom's West Coast		Delivery to Hull - $.35 extra, via Foreign Flag Vessels. Delivery to London - $.35 extra, via Foreign Flag Vessels. Delivery to Liverpool - $.18 extra, via Foreign Flag Vessels.
Northern Europe All Regions[c]		
	Rotterdam	Delivery to Hamburg - $.25 extra. Delivery to Antwerp - $.10 to $.15 extra. Delivery to Germany - $.25 extra.

[c]Great Lakes, North Range, Gulf, and North Pacific.

Freight Rates for Heavy Grain

Tramp shipping of United States heavy grain under voyage charter was divided into two distinct markets, the United States-flag vessels and foreign-flag vessels. The rates charged by the United States-flag vessels were so much higher than the foreign-flag rates that there was no competition between the two sectors. The United States-flag vessels compete with each other for 50 percent of the Government-sponsored cargoes guaranteed to them by the Cargo Preference Act of 1954 (25). The foreign-flag vessels compete for the remaining 50 percent of Government-sponsored cargoes and the private sectors.

One study (8) available was concerned with the statistical analysis of ocean freight rates for heavy grains shipped via voyage chartered tramp vessels. The study covers the years 1961-1965. It excludes the lighter grains; oats, barley, and rye, because of their erratic movement and significantly higher rates per ton would have caused excessive fluctuations of the data (8). It also excludes fixtures reported for cargoes of less than 5,000 long tons.

Since data was not available on a port-to-port basis, both origin and destination ports included were arranged into groupings commonly used by the shipping industry. Quotations were sorted by the origin-destination couplets, or "trades", and further sorted to segregate United States

registry ships in those trades where they were found (8).

The rate shown in each quotation for a trade was weighted by the tonnage associated with that rate and aggregated on a quarterly basis to form a weighted average. Whenever the quotation allowed for a range in tonnage, the lowest tonnage shown was used. The quantities shown moving by tramp ships were, therefore, understated possibly by 5 to 10 percent.[1] When quotations used, provided for optional origins or destinations, optional rates were aggregated with principal rates to calculate the average rates (8).

Hutchinson (8), by the use of linear regression to compare the changes in freight rates for each trade route with the changes in rates of every other trade route, concluded that rates of United States-flag vessels operate independently of each other and the market for foreign-flag vessels. The rates for foreign-flag vessels were found to be somewhat interdependent with the rates for United States Gulf originating trades. He also found, except for the United States Gulf to North Africa trade, that rates for the trades originating in the Gulf were related to each other and to the rates associated with trades originating at other United States ports. Rates to the United Kingdom from North Atlantic ports were also related to similar rates from the

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[1] The range allowed in most quotations is usually 5 percent, such as 10,000-5%, which means the shipper can ship anywhere from 9,500 long tons to 10,500 long tons. Hutchinson (8) always chose the lower tonnage.

Gulf.

Rates in the foreign-flag market showed sharp absolute fluctuations as well as greater variations than those found in the United States-flag rates. The relative stability of United States-flag rates were probably caused by statuatory limitations placed upon the ocean shipping rates which may be paid from concessional sales (8).

Fluctuations of ocean freight rates for heavy grains are a result of numerous and complex factors. Many of the factors influencing the supply and demand were international in origin. Three such factors seem to play a very important role, those being political, economic, and military events. The comparison of a short list of such events to the monthly highs and lows of freight rates for ten years will show the influence. The comparison plus an analysis of weighted monthly average and yearly means of ocean freight rates will complete the section.

Freight rate fluctuations and world events

The list of world events below, although incomplete, represents the major events that have happened in the ten year period. The two trade routes used were; North Pacific to Japan, and the Gulf to Antwerp or Rotterdam. The monthly lows and highs for ten years of freight rates for the two trade routes were plotted in Figure 1.

The economic and political events considered are (3):

1957 March 27; Reopening of the Suez Canal for passage of ships of 10,000 tons dead weight.

1958 July 14; Revolt in Iraq, followed by British and American landings in Jordan and Lebanon.

1959 April 25; St. Lawrence Seaway opened.

1960 December; Reports of famine conditions in China.

1961 January; Beginning of large-scale imports of grain and fertilizers by Communist China.

1962 September-October; Build-up and withdrawal of Russian missiles from Cuba.

1963 August-September; Russian purchase of Canadian and Australian grain.

1963 October; Russian negotiations for American grain. Freight market booms.

1964 March; Tanker tonnage of over a million turned to grain trading.

August; Famine in India. A million tons of shipping chartered for movement of United States grain to India.

October; Change of government in United Kingdom. Change of government in U.S.S.R.

1965 Escalation of the Vietnam War causes the United States government to step-up chartering of foreign flag vessels to supplement

its own tonnage.

September; India-Pakistan conflict over Kashmir. War risk insurance rates applied.

October; Reports of poor grain crops in Eastern Canada and Eastern Australia.

December; Drought reports in Central Africa.

1966 May; British seamen strike for 40 days.

From Figure 1 the influence the list of events had on each trade route can be evaluated. As readily seen, with the reopening of the Suez Canal in March of 1957, freight rates tumbled to a level where December rates were one-third the value of rates present earlier in the year. Rates remained relatively stable until July, 1958, when a revolt in Iraq, followed by British and American landings in Jordan and Lebanon, disrupted their stability. The Gulf to Antwerp or Rotterdam rate rose, but the Middle East conflict did not influence the North Range to Japan rate appreciable. The "memories" of the previous closing of the Suez Canal and subsequent high freight rates may have caused many firms to over react and charter an excess amount of tonnage with the results being an enlarged demand.

On April 25, 1958, the St. Lawrence Seaway opened. A drop in the rate for both trade routes occurred. December, 1960, reports of famine conditions in China resulted in large-scale imports of grain and fertilizer in January, 1961.

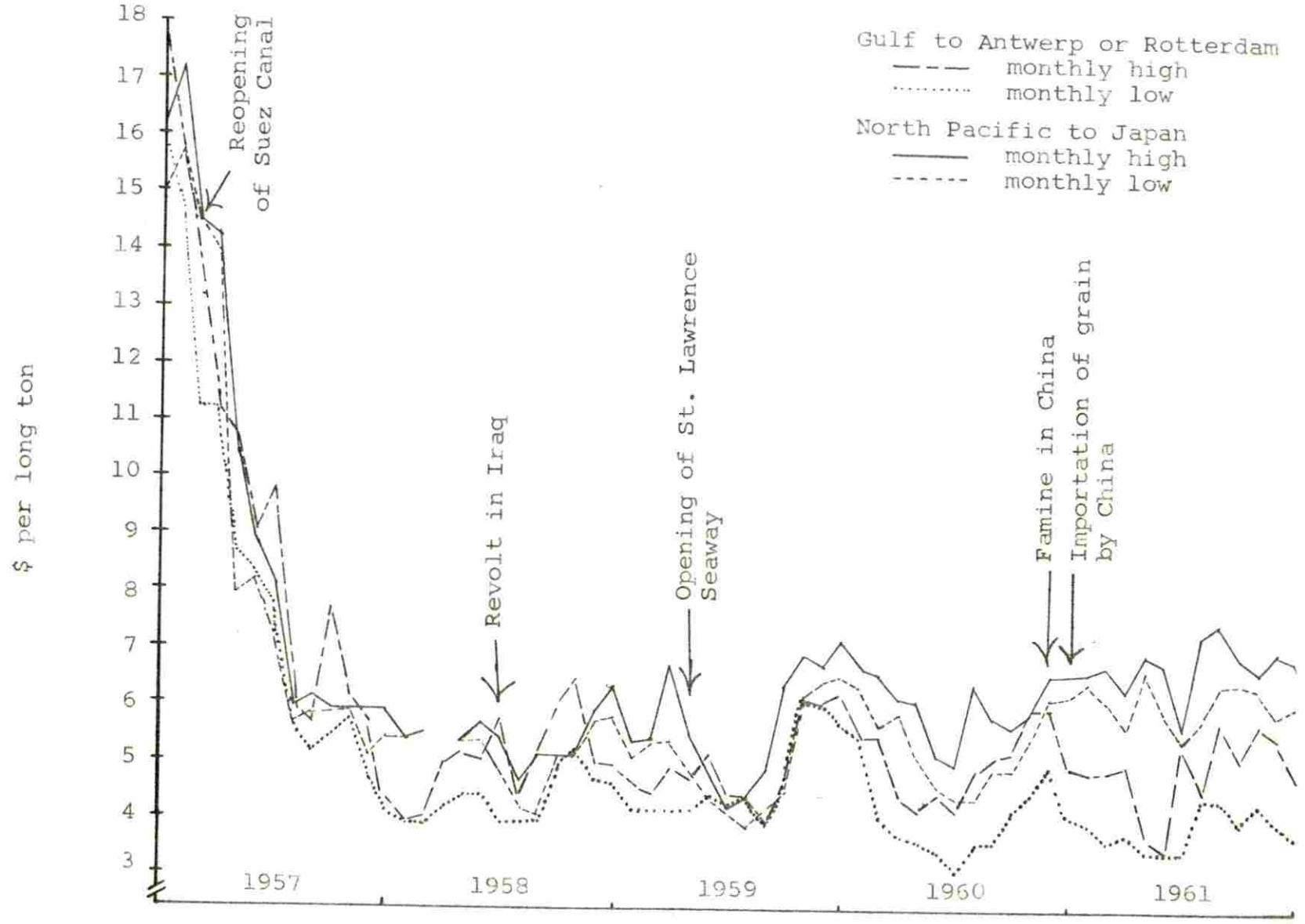

Figure 1. Freight rates and world events from Daily Freight Register (3).

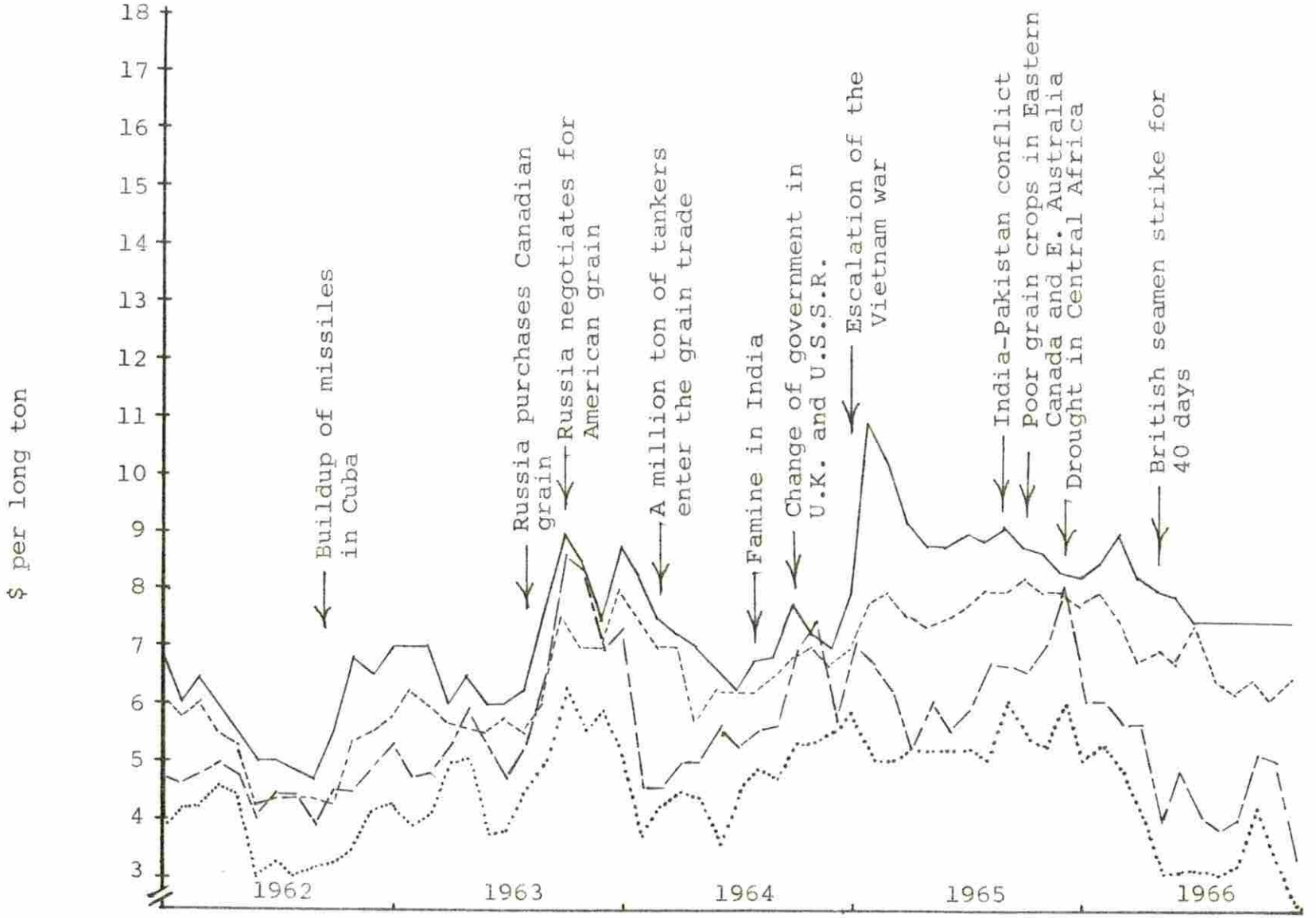

Figure 1 (Continued)

The results were that the freight rate from the North Pacific to Japan held at a higher level with less variation than previous years. There appeared to be no effect on the Gulf rate.

The build-up and withdrawal of Russian missiles from Cuba in September-October, 1962, may have caused the rates for both trade routes to increase, but it was impossible to determine if the missile build-up or seasonal variation caused the increase.

In August-September of 1963, Russia purchased Canadian and Australian grain. In October, the Russians completed negotiations for American grain. Rates for both trade routes increased significantly with the Gulf to Antwerp or Rotterdam rate showing the largest increase.

In March, 1964, tanker tonnage of over a million tons turned to the grain trade. The Japanese rate was not effected because tankers were not employed in the trade to Japan. The rate to Antwerp decreased for the next four months.

A famine in India in August of 1964 resulted in the shipping of over a million tons of United States grain to India. Most of the grain shipped to India originated from either the Gulf or the North Pacific, the result was that the rate for both trades were affected.

The most important event in 1965 was the escalation of the Vietnam war which resulted in increased chartering of

foreign-flag vessels to supplement the U.S. tonnage. Rates for both trade routes stayed above normal throughout the entire year.

For 1967, the freight rates for both trade routes decreased from the 1966 level. The rate difference between the two trades which became quite evident in 1965 continued to exist in 1967.

Freight rates for heavy grains were subject to many fluctuations as was evident for the ten year period. The partial list of world events accounted for some of the fluctuations, but not for all. Variations within a month were also unaccounted for.

Analysis of freight rates

Since data was limited on a port-to-port basis, it was necessary to group the freight rates for heavy grains into ranges. Even with the grouping of the rates into ranges, most trade routes had none or too few fixtures to indicate the relative monthly rate level associated with the trade routs.

Appendix A contains for a select few trade routes the derived monthly weighted averages of the ocean freight rates for heavy grains shipped via voyage chartered tramp vessels for 1958, 1966, and 1967. The number of monthly averages for many trade routes were too few in number to provide the

basis for a conclusion.[1] The averages for all trade routes showed a great variation.

Each charter agreement has its own unique provisions, therefore, it was necessary to make several assumptions to enable the aggregation of the rates. The assumption of no multiple deliveries or loadings is still in effect. The adjustment of the rates associated with multiple port loading or unloading were required. Charges for multiple port loading were taken from Table 15. Charges for multiple port deliveries are listed in Table 17. The charges for multiple port loadings or deliveries were subtracted from the freight rates where it was applicable.

It was also necessary to convert all rates to a free delivery basis. Charges for the conversion of free-in and out terms to free delivery terms are listed in Table 18. These charges were derived from the stevedore rates listed in Table 19. To convert free-in and out to free delivery it was necessary to add the charges to the free-in and out rates.

The conversion of gross terms to free delivery was accomplished by the subtraction of charges listed in Table 16. The conversion in the Indian and Antwerp trades were accomplished by the subtraction of the amount $1.05 (16, 17, 18).

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[1]There were no shipments of heavy grains in our sample for 1958 to Chile, Haiti, Madras, Union of South Africa, and the Philippines.

Table 17. Charges for delivering to an extra port[ab]

Destinations	1958		1966		1967	
	Foreign-flag vessels	United States-flag vessels	Foreign-flag vessels	United States-flag vessels	Foreign-flag vessels	United States-flag vessels
Chile	25[c]		25[d]			
Peru	25		25			
Brazil	25		25	50	25[e]	50
Venezuela	25		25		25	
Haiti	25		25			
Philippines	25		25		25	
Madras	35	35	35	50	35	
East Coast of India	35	35	35	50	35	
Bombay	35	35	35	50	35	
West Coast of India	35	35	35	50	35	
Japan	25		20		20	
Union of South Africa	25		30		30	
Norway	25		25		25	
Italy	25		25		25	
Hamburg	25	25	25		25	
Antwerp	25		25		25	
Rotterdam	25		25		25	
Antwerp, Rotterdam, or Amsterdam	25		25		25	
United Kingdom	35		35		35	

[a]Charges represent the modal value associated with charters for that particular trade.

[b]In cents per long ton.

[c]Maritime Research, Inc. (16).

[d]Maritime Research, Inc. (17).

[e]Maritime Research, Inc. (18).

Table 18. Derived stevedore rates for heavy grains for the four port regions

Type of vessel	Great Lakes	North Range	Gulf	North Range
Non-tanker[a]	$.33[b]	$.41	$.28	$.47
Tanker[c]	$.52	$.65	$.30	$.60

[a]Non-tanker rates are derived from Table 19. The method was to find the average for the bulk carrier and the tween deck vessel for each port region and to then use the average of these two numbers. The numbers were rounded to the nearest whole cent.

[b]All charges are per long ton.

[c]Finlayson, John. Cooke and Company, Grain Division, Memphis, Tenn. Data on stevedore rates. Private communication. 1969.

Table 19. Stevedore rates for heavy grains for the four port regions[a]

Type of vessel	Great Lakes	North Range	Gulf	North Range
Bulk Carrier				
Self-trimming	$.14[b]	$.30	$.15	$.25
Non-self-trimming	$.28	$.30	$.15	$.45
Tween Deck				
Two decks	$.40	$.52	$.40	$.56
Three decks	$.50	$.52		$.62
Tanker	$.52	$.65	$.30	$.60

[a]Finlayson, John. Cooke and Company, Grain Division, Memphis, Tenn. Data on stevedore rates. Private communication. 1969.

[b]All charges are per long ton.

An amount of $3.20 (16, 17, 18) was used to adjust the rates in the trade routes to the United Kingdom.[1] Thompson (24) states that labor costs for unloading in the United Kingdom are approximately 2-1/2 times those at Rotterdam. It appears that our estimate may be a little high as although Rotterdam's charge for unloading was unknown, it should be lower or equal to Antwerp's.

With the blockage of the Suez Canal on June 6, 1967, it became necessary for vessels engaged in the trade to India to navigate around the tip of South Africa. All rates quoted after this data for shipments to Bombay or the West Coast of India, originating from the Gulf, North Range, or the Great Lakes were assessed an additional charge of $1.96 for foreign-flag vessels (16, 17, 18). All United States flag-vessels engaged in the same trade were assessed the charge quoted in an option that was available for all fixtures reported. This charge usually ranged from $4 to $6 (16, 17, 18).

Freight rates for 1958, although quite variable, remained at relatively the same level for all trade routes throughout the year. For 1966, freight rates declined from the highs recorded in the first few months of the year to lows for the

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[1] These charges were obtained by the pairing of similar fixtures, one with free delivery and one with gross terms. The charges are the mean of these differences.

year in December. The freight rates remained at this level until the Suez Canal closed on the 6th of June. This event immediately raised all rates, but the increase in rates was more gradual for trade routes not directly involved.

The presence of certain vessel types and flags was quite apparent. In the Indian trade, tankers and United States-flag vessels were more active in the shipments to Bombay than for shipments to the West Coast of India. The bulk of the shipments to the West Coast of India were aboard foreign-flag non-tankers, whereas the bulk of the shipments to Bombay was aboard foreign-flag tankers and United States-flag tankers and non-tankers.

There were also differences in the origin of the shipments to Bombay and the West Coast of India. Shipments to the West Coast of India originating from the North Pacific were non-existent, whereas there were shipments originating from the North Pacific to Bombay.

The bulk of the shipments to Japan originated from the Gulf and the North Pacific ranges. Except for 1958, all shipments to Japan were via foreign-flag non-tankers.

It was also quite apparent that the North Range and the Great Lakes range were in competition for shipments to Rotterdam, the United Kingdom, and A.R.A.[1] This was apparent

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[1]Antwerp, Rotterdam, or Amsterdam.

by an analysis of the absence and presence of the weighted monthly averages in the three trades. There was an absence of weighted monthly averages for the North Range during the months the Great Lakes were in operation, especially in the months June, July, and August. The presence of freight rates for the North Range for the months the Seaway was closed indicates that shippers utilize the North Range when the Seaway is under ice. It appears that the Great Lakes holds a competitive advantage over the North Range, and shippers were aware of it and took advantage of it by using the Seaway when it was in operation, then switching to the North Range when the Seaway was closed.

There exists great variation in the weighted monthly averages, the variations combined with few observation greatly limited the possible conclusions. The yearly means in Appendix B give a better view of the differences that exist between the types of vessel, the flag of the vessel, and the export range.

The differences in the freight rates between ranges of export should reflect the differences in stevedoring costs, the differences in distances to the destinations, and differences in the time needed to load the vessel. Table 20 lists the average number of days spent in port loading, which influence loading costs by requiring a certain number of lay days.

Differences in costs of unloading a tanker as compared to a non-tanker may account for part of the difference between the tanker and non-tanker rate. The freight rate difference for different type vessels seems to be smaller for American vessels than for foreign-flag vessels.

Differences in the rates for foreign-flag versus United States-flag were enormous. It was apparent that the foreign-flag vessels and United States-flag vessels were not in competition for the same cargoes.

Even with yearly means, the data was sparce. One of the more interesting observations was in the trades to Hamburg, Antwerp, and Rotterdam. It appears that Hamburg was the high cost port, with Antwerp next, and finally Rotterdam having the lowest rate of the three. But the most interesting observation was that the rates for shipments destined for Antwerp, Rotterdam, or Amsterdam (A.R.A.), had the lowest rate structure of all routes to northern Europe. The reason Hamburg was the high cost port may be partly explained by the larger number of days spent unloading as compared to the other destinations. The average number of days spend in port unloading is presented in Table 21.

Table 20. Average number of days spent in port loading

Port of Origin	Size of Vessel		
	15,000 D.W.T.[a]	30,000 D.W.T.	55,000 D.W.T.
Great Lakes			
Chicago	5[b]	X[c]	X
Duluth	5[b]	X	X
Toledo	5[b]	X	X
North Range			
Albany	5[b]	X	X
Baltimore	5[b]	7	X
Charleston	5[b]	7	X
Norfolk	5[b]	7	X
Philadelphia	5[b]	7	X
Gulf			
Baton Rouge	5[d]	7	Y[e]
Brownsville	5[b]	7	Y
Corpus Christi	4[d]	7	X
Destrehan	5[b]	7	Y
Galveston	4[b]	7	X
Houston	4[b]	5	7
Mobile	5[d]	7	10
New Orleans	5[d]	7	Y
Pascagoula	5[d]	7	Y
Beaumont	4[d]	5	Y
North Pacific			
Long Beach	4[d]	5	Y
Stockton	6[d]	8	Y
Sacramento	6[d]	8	Y
San Francisco	6[d]	8	Y
Portland	5[b]	7	X

[a]Dead weight tons.

[b]Davis, LeRoy (4).

[c]"X" means that this vessel cannot be loaded because of draft restrictions.

[d]Finlayson, John. Cooke and Company, Grain Division, Memphis, Tenn. Data on days in port. Private Communication. 1969.

[e]"Y" means that information for days in port for that size vessel was not available.

Table 21. Average number of days spent in port unloading

Port of Destination	Size of vessel		
	15,000 D.W.T.[a]	30,000 D.W.T.	55,00 D.W.T.
Chile	10[b]	20	X[c]
Peru	8[b]	15	X
Brazil	10[b]	20	X
Venezuela	13[b]	25	X
Haiti	15[b]	25	50
Philippines	15[b]	25	50
Madras, India	Y[d]	Y	Y
East Coast of India	14[b]	X	X
Bombay, India	8[e]	11	Y
West Coast of India	14[b]	25	X
Japan	8[b]	15	X
Union of South Africa	7[b]	10	X
Norway	5[b]	10	X
Italy	10[b]	15	X
Hamburg	4[e]	5	Y
Antwerp	3[e]	4	4
Rotterdam	3[e]	4	4
Antwerp, Rotterdam or Amsterdam	3[e]	4	4
United Kingdom	7[b]	10	X

[a]Dead weight tons.

[b]Davis, LeRoy (4).

[c]"X" means that this vessel cannot be loaded because of draft restrictions.

[d]"Y" means that information for days in port for that size vessel was not available.

[e]Finlayson, John. Cooke and Company, Grain Division, Memphis, Tenn. Data on days in port. Private communication. 1969.

SUMMARY AND RECOMMENDATIONS

Summary

It was apparent that there were two separate markets for voyage chartered tramp vessels, one for foreign-flag vessels, and one for United States-flag vessels. The rate difference makes it apparent that the two flags were not in competition with each other, otherwise the rates would be more equal.

One market consists of the United States-flag vessels competing for that portion of Government-sponsored heavy grain exports guaranteed them under the Cargo Preference Act of 1954 (68 Stat. 832).

Foreign-flag vessels competing for the private sector shipments and the remaining portion of the Government-sponsored shipments make up the second market. Rate fluctuations in this market were common with the variations being quite large. Rates in the United States-flag sector were much less subject to fluctuation.

Rate differences between tankers and non-tankers also exist. The difference should reflect the extra costs which the shipper must bear for the unloading of the tanker as compared to a non-tanker.

Rate differentials also could be the result of a shipper's purchase of additional services. Among the additional

services or options available were; load or deliver at two ports, load or deliver at a range port other than the one chartered, free delivery, gross terms, free-in and out, just to mention a few of the more frequently used options.

The influence on freight rates the naming of a specific port of loading or unloading will depend on the advantage or disadvantage in costs associated with the port. The naming of a specific port of loading or unloading has become more common in the past ten years. It appears that the trend of increased popularity of specific port charter will continue because increased congestion of certain ports is inevitable.

The relative importance of the United States-flag tramp also will change. The United States-flag tramp, whose livelihood depends on Government-sponsored shipments, will continue to operate only if Government-sponsored shipments continue. It is inevitable that the United States tramps will lose some of its share of the market to United States-flag liners, unless the tramp owners begin to replace the current tramp fleet which is of World War II vintage, and has surpassed the vessel's expected life, with the scrapping of many within the next few years.

The relative importance of the various export ranges should change in the future. The practice of not using the North Range when the St. Lawrence Seaway is open should continue. The future importance of the Great Lakes is uncertain.

With the advent of larger and larger vessels and the current limitation on size under the present lock system and its associated congestion, it appears that unless the lock system is enlarged to handle larger vessels and at a faster rate, the future use of the Great Lakes will be limited.

The Gulf region, with continued favorable railroad and barge rates and ever improving facilities, should continue to handle the major share of the heavy grain exports. The North Pacific will not greatly increase its relative share of the heavy grain exports until more favorable railroad rates are enacted from the grain producing areas of the country.

Recommendations for Further Study

This study was a comprehensive exploratory study into the ocean shipping of heavy grain. Any aspect of it could be enlarged upon to form numerous separate studies.

A study involving any one aspect of the United States merchant marine would be a fine beginning. Among the many possibilities are; its subsidy programs, labor union's influence, shipbuilding costs, operating costs and technological improvements. Such studies should have as their primary objective the improving of the United States fleet so it could compete effectively with foreign-flag vessels.

An analysis into the factors that cause the levels of demand and supply to fluctuate also would be of interest. There is the possibility of formulating plans or policies for international regulation of such factors. A similar analysis could be made into the possibility of regulating ocean freight rates for bulk commodities shipped on tramp vessels.

The results of the present study on costs and rates have suffered immensely from lack of available data. An expanded study, with the cooperation of private grain exporters, into the variations of costs associated with respect to loading and unloading of heavy grain in all major grain handling ports of the world, would be of interest to all exporters. This analysis could easily be expanded to investigate the rate differential between different ports.

An attempt at forecasting changes needed to enable United States ports to handle future grain shipments would be of interest. An analysis into the feasibility of prescheduling future grain shipments in conjunction with the regulation of the supply of vessels and its influence on stabilization of freight rates would also be of interest.

The results of any of the above studies could be incorporated into an over-all plan enabling a producer of grain to transport his surplus grain to deficit areas at the least cost.

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APPENDIX A. 1958, 1966, AND 1967 MONTHLY WEIGHTED AVERAGES OF FREIGHT RATES FOR HEAVY GRAINS SHIPPED VIA TRAMP VESSELS

Table 22. Bombay, India: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1958[a]

Vessel type and range of origin	Month				
	Jan	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific				7.63	
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range		17.80	17.90		
Gulf			16.34		
North Pacific	14.35	15.73	15.45		
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (16).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		16.71[b]				8.23
				8.05		8.05
	12.95	22.48 15.20	19.08	23.50 24.50 16.79	23.50 24.50 17.71	16.95 15.95

Table 23. Bombay, India: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1966[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific		10.22			
Tanker					
Great Lakes					
North Range		10.15	9.45	9.10	
Gulf		12.25	9.65	9.28	8.13
North Pacific		11.46	10.71		
American Vessels					
Non-tanker					
Great Lakes					
North Range			27.75	27.50	
Gulf			28.75	28.44	28.37
North Pacific					
Tanker					
Great Lakes					
North Range		26.20		28.00	
Gulf			29.02	29.13	29.25
North Pacific			27.25	28.25	

[a]Maritime Research, Inc. (17).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		9.39[b]	11.90	12.00	8.75	
8.75	8.28	7.92 6.30	8.82	9.03	9.93	10.13
28.25	21.00	22.00 27.71	26.00 27.75	27.00 26.25	27.89 29.72 28.75	29.70
25.75	24.65	21.00 30.27 25.44	26.71 28.27 26.24	28.55 25.75	27.94 29.64 29.12	27.69 29.74 29.00

Table 24. Bombay, India: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1967[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range			8.20		6.65
Gulf	8.75	7.46	7.08	7.26	7.89
North Pacific					
American Vessels					
Non-tankers					
Great Lakes					
North Range	27.82				26.75
Gulf	29.75	27.50	29.50	28.60	28.60
North Pacific			27.00		
Tanker					
Great Lakes					
North Range					
Gulf	29.45	29.70	29.48	28.78	29.01
North Pacific	29.00		28.23	26.25	

[a]Maritime Research, Inc. (18).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	11.90	14.35[b]	17.78	15.68		11.13
6.09		14.35				
29.51	31.82	34.74	27.88	33.24 28.40	33.24	
30.98	32.44 28.71	33.24 28.33	33.24	33.24 28.38	33.24	

Table 25. West Coast of India: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1958[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes					
North Range	9.00[b]		8.05	8.05	9.41
Gulf		9.12			11.02
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (16).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		10.39	9.20	8.37	8.88	9.03
	7.68	10.85	8.75			9.45

Table 26. West Coast of India: monthly weighted averages of freight rates for havey grains shipped via tramp vessels for 1966[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes					
North Range		13.01	13.65	14.83	
Gulf	13.86	13.66	14.05	15.59	14.70
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf				12.67	11.32
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (17).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
			15.05[b]			
13.00	13.30	11.27	10.00		13.30	13.30
13.30	12.83	11.83	12.03	12.39	13.38	12.91
			10.85			
			27.10			
	29.70	30.59	29.50	29.74		

Table 27. West Coast of India: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1967[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes					
North Range	11.90	11.20	12.22		13.58
Gulf	12.73	11.46	12.82	13.87	13.93
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					9.29
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range		28.00			
Gulf					
North Pacific	26.50				
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (18).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
				20.65[b]		
				18.20		
15.54	18.06	18.03	18.24	18.55	18.55	18.12
			28.38			
					33.24	

Table 28. Japan: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1958[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes					
North Range				8.00[b]	
Gulf	9.00	9.26	8.55	8.07	8.61
North Pacific	6.00	6.26	5.50	5.50	5.50
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					10.50
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (16).

[b]All rates in dollars per long ton.

Month						
June	July	Aug	Sept.	Oct.	Nov.	Dec.
					8.75	
8.25	8.24	8.01		8.14	8.70	8.63
5.96		5.19	4.97	4.66	5.43	5.78

Table 29. Japan: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1966[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes				14.74[b]	14.75
North Range		11.50			
Gulf	12.14	11.40	11.75	11.69	11.05
North Pacific	8.25	8.15	8.13	8.27	8.00
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (17).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
14.13		14.25		13.83		
9.95	9.34	9.26	9.62	10.28	10.13	9.64
7.50	6.75	7.00	6.67	7.18	6.67	6.84

Table 30. Japan: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1967[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes				12.75[b]	
North Range					
Gulf	8.35	8.90	9.80	10.83	10.42
North Pacific	6.58	7.01	6.72	7.09	7.45
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tankers					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (18).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
10.45	11.75	12.98	13.57	12.67	11.58	12.09
7.52	8.22	8.96	9.20	8.95	8.96	8.91

Table 31. Rotterdam: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1958[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf	4.50				4.75
North Pacific			7.00		
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (16).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
					5.10[b]	4.40
4.35		4.15		5.25		4.45
	6.25					

Table 32. Rotterdam: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1966[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes				10.07[b]	
North Range	5.00	4.71	5.01	4.66	3.75
Gulf	5.71	5.35	5.65	5.43	4.64
North Pacific		8.30	8.90		
Tanker					
Great Lakes					
North Range					
Gulf			4.90	4.52	4.40
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (17).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
8.26	7.20	7.25	7.29	8.18	7.00	
5.41					4.31	4.31
3.91	3.76	3.73	3.22	3.68	4.54	3.57
		7.27				
3.55						

Table 33. Rotterdam: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1967[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes				7.63[b]	7.83
North Range			4.00		
Gulf	2.94	3.64	3.97	3.90	3.94
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf			4.05		
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (18).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
7.90	9.25		8.73	9.39	10.44	
			5.77	5.96	6.04	6.75
4.08	5.49	5.11	5.64	5.75	6.22	6.21

Table 34. Antwerp, Rotterdam, or Amsterdam: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1958[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes					
North Range			3.50[b]		
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (16).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
					4.60	
	3.34					4.53

Table 35. Antwerp, Rotterdam, or Amsterdam: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1966[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes				8.33[b]	9.24
North Range				5.01	
Gulf	5.64	5.43	5.25	5.50	3.99
North Pacific		8.95			
Tanker					
Great Lakes					
North Range					
Gulf				4.05	3.82
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (17).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
8.17	7.68	7.36 3.00	7.13	7.74	8.09	
3.39	3.77	3.43	3.44	3.84	4.13	3.80
3.33	3.18				3.55	

Table 36. Antwerp, Rotterdam, or Amsterdam: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1967[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes				6.65[b]	6.85
North Range				4.16	
Gulf	2.93	3.38	4.45	3.50	3.60
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf	2.98				3.03
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (18).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
8.25	8.55	7.70	7.96	9.46	8.93	
		4.16		5.66		
3.30	4.30	4.68	5.46	5.53	5.40	5.70

Table 37. United Kingdom: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1958[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes					
North Range	5.25[b]	5.60		5.24	
Gulf	5.74	5.75	5.46	5.57	6.40
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (16).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
5.64			5.07	6.13	6.57	6.46
6.68	6.47	6.12	6.08	6.67	7.11	7.10

Table 38. United Kingdom: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1966[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes				10.16[b]	10.17
North Range	6.03	6.49	6.49	6.90	
Gulf		7.20	6.89	8.00	7.41
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (17).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
9.26	9.40	7.71	8.44	8.51	8.89	
5.18					5.75	4.76
6.43	6.47	5.69	5.33		5.96	6.09

Table 39. United Kingdom: monthly weighted averages of freight rates for heavy grains shipped via tramp vessels for 1967[a]

Vessel type and range of origin	Month				
	Jan.	Feb.	March	April	May
Foreign Vessels					
Non-tanker					
Great Lakes				8.84[b]	9.40
North Range	4.23	3.89	4.46	5.20	4.91
Gulf	4.97		5.62	6.03	6.30
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
American Vessels					
Non-tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					
Tanker					
Great Lakes					
North Range					
Gulf					
North Pacific					

[a]Maritime Research, Inc. (18).

[b]All rates in dollars per long ton.

Month						
June	July	Aug.	Sept.	Oct.	Nov.	Dec.
9.22	10.15	11.90	9.45		11.09	
		5.60	6.64	7.36	7.34	7.52
5.88	7.84	8.22	7.18			

APPENDIX B. 1958, 1966, AND 1967 YEARLY MEANS OF THE WEIGHTED MONTHLY AVERAGES OF FREIGHT RATES FOR HEAVY GRAINS SHIPPED VIA TRAMP VESSELS

Table 40. Yearly means of the weighted monthly averages of freight rates for heavy grains shipped via tramp vessels for selected destinations for 1958, 1966, and 1967

Vessel type and range of origin	Chile			Peru		
	1958	1966	1967	1958	1966	1967
Foreign Vessels						
Non-tanker						
Great akes						
North Range						
Gulf		6.91[b]	8.33[d]	4.58[c]	7.59[b]	8.36[d]
North Pacific		7.25	9.00			
Tanker						
Great Lakes						
North Range						
Gulf						
North Pacific						
American Vessels						
Non-tanker						
Great Lakes						
North Range						
Gulf		17.67		11.13		
North Pacific						
Tanker						
Great Lakes						
North Range						
Gulf						
North Pacific						

[a]All rates in dollars per long ton.

[b]Maritime Research, Inc. (17).

[c]Maritime Research, Inc. (16).

[d]Maritime Research, Inc. (18).

Brazil			Venezuela		
1958	1966	1967	1958	1966	1967
				10.94[ab]	
	7.13[b]			6.30	
6.08[c]	7.25	8.45[d]	4.40[c]	5.76	7.63[d]
			4.75		6.60
					8.63
5.75					
	18.30				
14.25	19.82	20.28			
5.75					

Table 41. Yearly means of the weighted monthly averages of freight rates for heavy grains shipped via tramp vessels for selected destinations for 1958, 1966, and 1967

Vessel type and range of origin	Haiti			Philippines		
	1958	1966	1967	1958	1966	1967
Foreign Vessels						
Non-tanker						
Great Lakes						
North Range						
Gulf		5.33[c]	6.27[d]			
North Pacific					8.38[c]	8.68[d]
Tanker						
Great Lakes						
North Range						
Gulf			3.55			
North Pacific					9.04	7.50
American Vessels						
Non-tanker						
Great Lakes						
North Range						
Gulf			8.88			27.97
North Pacific						
Tanker						
Great Lakes						
North Range						
Gulf						
North Pacific						

[a]All rates in dollars per long ton.

[b]Maritime Research, Inc. (16).

[c]Maritime Research, Inc. (17).

[d]Maritime Research, Inc. (18).

Madras, India			East Coast of India		
1958	1966	1967	1958	1966	1967
			10.00[ab]	13.30[c]	15.69[d]
		13.18[d]	9.28	13.83	15.33
		11.90	8.68	11.50	11.05
					10.82
	10.92[c]			10.78	11.48
					8.82
			25.65	27.95	31.00
		35.19	26.18	31.25	25.72
			24.89	28.46	31.35
				30.00	30.75
				30.00	31.24
				38.32	26.73

Table 42. Yearly means of the weighted monthly averages of freight rates for heavy grains shipped via tramp vessels for selected destinations for 1958, 1966, and 1967

Vessel type and range of origin	Bombay, India			West Coast of India		
	1958	1966	1967	1958	1966	1967
Foreign Vessels						
Non-tanker						
Great Lakes					15.05[ab]	20.65[c]
North Range	16.71[d]			8.93[d]	12.85	13.42
Gulf	8.23	10.54[b]	15.94[c]	9.48	13.38	15.82
North Pacific	7.63	10.22	11.52			
Tanker						
Great Lakes						
North Range	8.05	9.57	7.43			
Gulf		9.29	8.80		11.61	9.29
North Pacific	8.05	9.49	6.09			
American Vessels						
Non-tanker						
Great Lakes						
North Range	20.68	25.36	27.29		27.10	28.00
Gulf	20.64	28.49	30.85		29.88	
North Pacific	15.52	27.58	27.76			27.44
Tanker						
Great Lakes						
North Range		26.26				
Gulf		28.43	31.16			33.24
North Pacific		27.29	28.15			

[a]All rates in dollars per long ton.

[b]Maritime Research, Inc. (17).

[c]Maritime Research, Inc. (18).

[d]Maritime Research, Inc. (16).

Japan			Union of South Africa		
1958	1966	1967	1958	1966	1967
	14.34[b]			9.25[b]	
8.38[d]	11.50				
8.50	10.52	11.12[c]		8.72	8.22[c]
5.52	7.45	7.96			

10.17

Table 43. Yearly means of the weighted monthly averages of freight rates for heavy grains shipped via tramp vessels for selected destinations for 1958, 1966, and 1967

Vessel type and range of origin	Norway			Italy		
	1958	1966	1967	1958	1966	1967
Foreign Vessels						
Non-tanker						
Great Lakes		7.42[ab]			10.94[b]	11.96[c]
North Range		5.53	5.82[c]	6.25[d]	9.28	9.00
Gulf	6.74[d]	5.42	5.50	6.91	6.85	9.47
North Pacific		8.26				
Tanker						
Great Lakes					11.12	
North Range						
Gulf					6.71	6.00
North Pacific						
American Vessels						
Non-tanker						
Great Lakes						
North Range						
Gulf				15.16		
North Pacific						
Tanker						
Great Lakes						
North Range						
Gulf						
North Pacific						

[a] All rates in dollars per long ton.

[b] Maritime Research, Inc. (17).

[c] Maritime Research, Inc. (18).

[d] Maritime Research, Inc. (16).

Hamburg			Antwerp		
1958	1966	1967	1958	1966	1967
	7.38[b]	9.92[c]		8.09[b]	8.74[c]
3.70[d]	5.59		3.93[d]	5.36	
8.06	4.58	5.78	4.41	4.11	4.57
		8.50	6.27		
	8.11			9.52	
	3.83			4.05	3.30
			10.65		
11.00					

Table 44. Yearly means of the weighted monthly averages of freight rates for heavy grains shipped via tramp vessels for selected destinations for 1958, 1966, and 1967

Vessel type and range of origin	Rotterdam			Antwerp, Rotterdam, or Amsterdam			United Kingdom		
	1958	1966	1967	1958	1966	1967	1958	1966	1967
Foreign Vessels									
Non-tanker									
Great Lakes		7.91[ab]	8.74[c]		7.97[b]	8.04[c]		9.07[b]	10.01[c]
North Range	4.75[d]	4.65	5.70	4.05[d]	4.01	4.66	5.75[d]	5.94	5.72
Gulf	4.58	4.43	4.74	3.94	4.30	4.35	6.26	6.55	6.51
North Pacific	6.63	8.60							
Tanker									
Great Lakes		7.27							
North Range									
Gulf		4.34	4.05		3.59	3.01			
North Pacific									
American Vessels									
Non-tanker									
Great Lakes									
North Range									
Gulf									
North Pacific									
Tanker									
Great Lakes									
North Range									
Gulf									
North Pacific									

[a]All rates in dollars per long ton.

[b]Maritime Research, Inc. (17).

[c]Maritime Research, Inc. (18).

[d]Maritime Research, Inc. (16).

APPENDIX C. CARGO PREFERENCE ACT

CARGO PREFERENCE ACT OF 1954

(68 Stat. 832)

Public Law 664 Chapter 936

An Act

To amend the Merchant Marine Act, 1936, to provide permanent legislation for the transportation of a substantial portion of waterborne cargoes in United States-flag vessels.

Be it enacted by the Senate and the House of Representatives of the United States of America in Congress assembled, that section 901 of the Merchant Marine Act, 1936, as amended, is hereby amended by inserting "a" after "Sec. 901." and by adding at the end of the section the following new subsection: "(b) whenever the United States shall procure, contract for, or otherwise obtain for its own account, or shall furnish to or for the account of any foreign nation without provision for reimbursement, any equipment, materials, or commodities, within or without the United States, or shall advance funds or credits or guarantee the convertibility of foreign currencies in connection with the furnishing of such equipment, materials, or commodities, the appropriate agency or agencies shall take such steps as may be necessary and practicable to assure that at least 50 per centum of the gross tonnage of such equipment, materials, or commodities (computed separately for

dry bulk carriers, dry cargo liners, and tankers), which may be transported on ocean vessels shall be transported on privately owned United States-flag commercial vessels, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels, in such manner as will insure a fair and reasonable participation of United States-flag commercial vessels in such cargoes by geographic areas: Provided, That the provisions of this subsection may be waived whenever the Congress by concurrent resolution or otherwise, or the President of the United States or the Secretary of Defense declares that an emergency exists justifying a temporary waiver of the provisions of section 901 (b) and so notifies the appropriate private agency or agencies: and provided further, That the provisions of this subsection shall not apply to cargoes carried in the vessels of the Panama Canal Company. Nothing herein shall repeal or otherwise modify the provisions of Public Resolution Numbered 17, Seventy-third Congress (48 Stat. 500), as amended."

Approved August 26, 1954.